

DRAGON USER

International edition

The independent Dragon magazine

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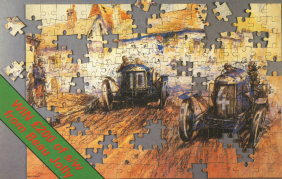
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How to submit articles

The quality of the material we can publish in
Dragon User each month will, to a very great
extent, depend on the quality of the
documents that you can make with your
Dragon. The Dragon computer was launched
on to the market with a powerful version of
Basic, but with very poor documentation.

Articles which are submitted to Dragon
User for publication should not be more than
3000 words long. All submissions should be
typed. Please leave wide margins and a
double space between each line. Programs
should, whenever possible, be computer
printed on plain white paper and be accom-
panied by a tape of the program.

We cannot guarantee to return every
submitted article or program, so please keep a
copy. If you want to have your program
returned you must include a stamped,
addressed envelope.

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Including this month information on multi-
tall Dragons, an RTT answer and how to
secure a program listing.

News

The latest on GBC's marketing plans and
details of new peripherals and software on
release.

Clubs

Local and national clubs are now providing
an important service to Dragon users —
Gordon Ross details the growing club
network.

Dragonsoft

Dragon software seems to have made a
comeback recently, our reviewers give the
lowdown on what to expect.



Chip Shop

Keith and Steven Brain update two Basic-
codes that allow you to tune into the GBC's
Chip Shop show.

Versatile Interfacing

Brian Cadge takes a look at a simple
interface from MCU Electronics.

5 Snakes alive

Andrew Ward sets his snake on a pit
eating outing in our program of the month.

Bookbytes

Our reviewers help you select the books
that are most likely to suit your needs.

Dragon designs

David Sans gives you the information
necessary to create good graphics and
improve your programs.

Open file

Readers' programs: This month include a
screen editor and a Swapover listing.

Tandy/Dragon conversions

Jason Nichols lists the Dragon and CoCo
tokens used to represent Basic commands
and shows how to play a tape on one
micro when it is programmed for the other.

Adventure column

Mike Gerrard continues his survey of the
adventure scene.

15 Dragon Answers

Brian Cadge offers a range of advice
including instructions on the Dragon's re-
lease command and information on moving
graphics pixel by pixel.

Competition corner

Brian Jolly provides the prizes to Gordon
Lee's card trick question.

Editorial

NINETEEN EIGHTY FOUR is a date that has been associated with catastrophe and
loss ever since George Orwell wrote his chilling vision of the future in 1948. In the
event, of course, 1984 turned out to be something of an anticlimax. No Big Brother, no
Airstrip One.

For the computer industry, however, 1984 still has a certain significance. The pundits
who had been predicting a massive shake-out in the market drew some satisfaction from
the disappearance of Tycom and Computers, though this was balanced to some extent
by the emergence of Amstrad.

The Japanese also made their long-awaited entrance into home computers with the
multi-typed MSX. But, despite the Japanese domination of the hi-fi and electronics
markets, there are some doubts as to whether they will similarly take over the micro
market. The 280, eight bit, standard around which MSX is based may be too
old-fashioned when compared with the newer 16-bit offerings from Sinclair et al.

Dragon, despite hefty cash injections, failed to overcome its cashflow and overstocking
problems, with the result that it was sold to Spanish company Suredard. Dragon
software houses immediately started to convert their programs to other machines, if they
had not done so already.

Jack Tramiel, the man who founded Commodore and built it up into a multi-million
pound company, resigned in a boardroom dispute. But, he bounced back within months
to buy troubled Atari from Warner. So, 1984 has been a year of considerable change for
the computer industry, if not quite the watershed envisaged by Orwell. What 1985 holds
in store is difficult to predict, other than that the market will become yet more competitive.
To misquote an ancient Chinese proverb: "We live in interesting times."

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Letters

This is the chance to air your views — send your tips, compliments and complaints to Letters
Page, Dragon User, 12-13 Little Newport Street, London WC2N 6LD.

Sing Dragon . . .

IF MAY I interest some readers who wish to use their Dragon to control a musical keyboard that they can in fact do so with the recently released Cassio MT 2000. This is one of a selection of mini-keyboards from Casio, it costs £136, and to link it up to the Dragon 32 the keyboard has an accessory interface — the RK 1. This costs £30, and plugs into the Centronics socket via a gender cable.

Using this system, the computer can be used to select one of the eight preset voices, start or stop one of the six preset rhythms, and can play up to eight notes — so the computer could be used as a sort of "sequencer" to build up a melody, or chord accompaniment, which can be played whilst you pick out a tune.

Obviously, it does not have the facilities of the MIDI system, or of a synthesiser. However, it does provide the Dragon with an excellent sound system at a reasonable price. The software must (at present) be home grown, but there is not too much heavy programming effort involved. I have this system myself and am basing a project for college on it.

Which brings me on to ask if anyone could tell me the function of each pin in the Centronics socket (Data, Strobe and so on). This will form a major part of my project and I would be very grateful for any help received.

Raymond Moxham
4 Mirfield Avenue
Higher Blakely
Manchester M20 2JH

. . . sing

IN ANSWER to the simultaneous guess from M Webb and J A Gill in October's Letters Page for A to D converters, I would like to point out that Electronix/Technology has been marketing a general purpose "control interface" for some months now.

The board, which plugs into the cartridge port, has both analogue (A to D and D to A converters) and digital input/output facilities (I/O), input interrupts and relay options. For the purpose of controlling voltage-controlled oscillators, the D to A converter has an 18V output voltage swing which should easily control a musical synthesiser. Software is

not so much of a problem as the manual carefully explains the individual functions of components used in the interface and gives Basic and "assembled" machine code examples for use.

The board has proved to be particularly popular with schools and colleges throughout the country and is used for numerous applications from robotics, artificial intelligence and speech recognition, to controlling 30-ton pneumatic hammer, security systems and laboratory experiments.

Dr Mark Wemyer
Electronix/Technology
2 Access Road
West Derby
Liverpool L12 4YH

Secure program

FOR SOME time I have been trying to "secure" a program using information from your magazine such as that to disable the LIST, LIST and break keys. I have even included a subroutine to "cool start" (as I call it) and have tried the "stop-on-error" routine printed in the magazine but this has the effect of freezing the machine rather than running it (but at least it prevents access to the program).

Here is a subroutine I use to input from the keyboard. If INPUT is used the break key successfully breaks the program:

```
18000 AG=INKEY:IF AG=0 THEN 18000
18001 IF AG=CHR(13) THEN RETURN
18002 PRINT AG:
18003 AG=AG-A$:"to create strings
18004 GOTO 18000
```

Using the VAL function to convert the string to a number if necessary. For example

```
50 PRINT @ AG, "ENTER FIRST NAME: " : GOTO 50
10000 A=VAL (AG:AG=" " THEN 10000) : stores the string variable for next input
```

```
60 PRINT @ 57, "ENTER SECOND NUMBER":GOSUB 10000:B=VAL (B:B=" " THEN 60
```

Note the semi-colon after the print string to ensure that the key pressed is printed after the key pressed to enter. This should be omitted if the keypress is to be printed on the line below.

Using a similar subroutine (changing line 10000) to input an entry code to use the program or even to "enable" break so that only I can break the program I think I have finally "secured" it.

Richard Goss
Gosses
St Albans

ITT answer

WITH REFERENCE to Gerald Woodward's letter (October, Dragon User), I too purchased the same model ITT T4 synthesiser and initially had the same problem.

I finally solved it by trial and error and using the pin connection diagrams (provided with the T4 and also Dragon Data's "Information for machine code users").

I have used a 5-pin DIN plug with 2 x 4-pin core wires connected to the Dragon's monitor output, one to pins 3 and 2 for the video, and the other to pins 1 and 2 for sound (2 being earth). These are connected to the TV as follows:

Video signal to the SO 239 (RF) socket with the outer shield as earth. The sound signal is taken to the Audio in socket with the top pin as earth and the second wire connected to the lower Audio-Signal input.

The volume setting on the TV has to be set fairly high to obtain a normal sound level.

John Nash
Donington
Norfolk

Jolly good news

FOLLOWING a recent article in your publication regarding the Videopacks, we have had a number of letters from Dragon users asking where they can purchase the pack.

Unfortunately, due to lack of dealer and distributor response and support, we will not be releasing this pack. However, as a special offer to our readers we would be quite happy for them to write to us for the individual games and instead of paying the normal £5.50 price from the retailer, they can obtain four games for £14.95.

The games are:
Leggett, Peders, Cosmic Grater, S.C. 88.

We are also about to release Arcadia for the Dragon and we would include this game which will also retail for £5.50. The total for the five games will be £19.90. This means a saving of £7.00 on the five games.

Cathy Ashby
Beas, Jolly
134 New Broadway
Ealing
London W5 5AR

Across the Atlantic

I AM writing on behalf of Dragon users in the USA. The company that originally distributed the Dragon in America is, no longer supporting the Dragon. There seems to be very little hardware or software available and as a dealer this leaves me and my Dragon customers in a spot.

In looking through your magazine I see many sources for products, but almost all of them are not distributed in the United States. I would be most interested in hearing from any companies that have a USA distributor or who want to give details on shipping products to America.

Kay Sharp
Computer Corner
1044 N. Salsman Avenue
Biloxi, MI 48822
USA

Software Top 10

- | | | | |
|----|-----|--------------------------|-----------------|
| 1 | 80 | Hunt/Bliss | Coswin |
| 2 | 1-1 | Mystery of the Java Star | Shands |
| 3 | 85 | Murphy Hardest | Melbourne House |
| 4 | 1-1 | Mr Dig | Microdeal |
| 5 | 1-1 | Outdoors in Space | Microdeal |
| 6 | 1-1 | Kingspool | Beyond |
| 7 | 28 | Chuckie Egg | A & P |
| 8 | 1-1 | Dragon Chess | Oasis |
| 9 | 28 | Ring of Darkness | Watersoft |
| 10 | 1-1 | Eightball | Microdeal |

Chart compiled by Websters Software

GEC sells last stock



GEC HAS sold all of its existing stock of Dragon products and has no immediate plans to promote the Dragon. Denis Judd, marketing manager of GEC Radio and Television, said that all of GEC's stocks of the Dragon 32 and 64 had been sold to an undisclosed buyer, together with small quantities of single and double density disk drives. Delivery of the goods is to take place shortly.

It is not known what price was paid for the goods nor what price the products will be sold for when they eventually reach retail outlets.

It now looks as if GEC's association with the home computer market is in doubt. Although the company is in contact with Euxford SA, the Spanish manufacturers of

the Dragon, it has not yet come to any agreement over future marketing arrangements.

GEC has also shelved any immediate plans to manufacture an MSX computer. Denis confirmed that the company does not have a licence from Microsoft — the American licensor of the MSX standard.

One piece of good news, however, is that GEC is currently formulating plans to establish a Dragon repair and warranty service, possibly in conjunction with Teachmaster — the company formed by ex-Dragon Data directors Brian Moore and Richard Wajman.

The service, it is hoped, will cover Dragons sold both before and after the crash of Dragon Data earlier this year.

Dragon modem



A FULL facility modem, hardware compatible with the Dragon, has just been released by Unicom for £49.95 excluding VAT. The modem features auto dial, auto redial, auto answer, auto band rate scan, full duplex, half duplex, bulletin board facility and number memory store.

Island sales are 300-300.

1900/75 and 75/1000. Unfortunately, the company is not producing any software for the Dragon, so users of the system would have to write their own or rely on existing software provided by Caltwell Computers.

Caltwell has just released a new modem software package which features 40 column

New releases

MONSTERS, lightning bolts and ice parties play a major part in some of the latest releases for the Dragon.

New from Cable Software in time for Christmas are three titles all retailing for £9.95 each. *Fighting Fantasy* is an arcade adventure with 35 screens which are in effect interconnected rooms. You move the character of a man by use of the joystick. Each room has different guards and objects to be overcome.

The game can be played either as an arcade game or an adventure. In order to reach the last screens, careful planning and thought is needed, according to Peter Phillips of Cable Software.

"You will need to plan a map in order to locate the keys needed to open subsequent doors. Also, various weapons are necessary to overcome opponents." The weapons include swords, lightning bolts and velocity spells. "It is a very complex, full colour animated machine code game, which for any other micro would have been called a mega-game" according to Peter.

Cable's other two releases are *Homebase* — an arcade type game written in 100 per cent machine code which is a sort of "Lunar Jet Man", with you flying about in a rocket launcher firing off other craft; and *on*, as yet, untitled program involving nine different screens with revolving doors and a mad woman called Edna. Written in machine code it also is a multi-screen arcade game with full colour animation.

With every full price paid for

a title from Cable Software users are being offered a free game from the following Cable titles: *Living Stone*, *Geography*, *Drinks*, *Dragonrunner*, *Trade Name*, *Game Fighter*, *Reckless*, *Dragon Race*, *Wasp Invasion*. Two full price games will get you two free games. Further details from Cable Software (P.O. 1847-19) at 0592-581490.

Camdan Computers, a new name to Dragon owners, is releasing its first title for the Dragon called *Snowqueen*. Retailing for £9.95 the game is based on Hans Christian Andersen's immortal story in which the boy Kay is imprisoned by the Snow Queen in her palace of ice. He cannot gain his freedom until he can spell out the word ETEHELTY from ice fragments taken from a lake of ice in the palace.

The game is a mixture of educational and "fun" and is set for ages around seven and above. Further details from Camdan Computers, at 15 Denward Close, Prestatyn, Gwynedd LL19 7TT.

Finally, from Knight Software comes *Yumping* "basser who 'yumps' his way to the top of each of eleven screens making his way to the door, avoiding monsters and flying for a reward with his starting Daisy, and Time Attack from Tudor Williams, a low-resolution military graphics game with impossible mind probes, weapons and so on.

Further details from Knight Software at 33a High Street, Eaton, Cleveland TS6 6UD and from Tudor Williams Software at 15 Summer Road, Cleeve, West Midlands WV14 6RD.

screen display with upper and lower case characters. The program also enables the facility to take a printed copy of incoming data.

The inclusion of a print facility is to allow the Dragon to emulate a telex terminal. By using the facilities of Caltwell, the mailbox system operated by Cable and Unicom, it is possible to send and receive international and national text messages at any time of the day or night. Further information from Caltwell Computers at 4 Mollie Row, Gipping Norton, Oxfordshire



Maintenance guaranteed

YEARLY maintenance warranties are being offered by two new firms in the computer industry.

Following the collapse of Dragon Data several months

ago many readers have experienced trouble in getting their Dragon's repaired, especially with many service agents reportedly having difficulties in obtaining spare

parts. Now Global Computers and the Micro Repair Club are offering repair-guaranteed packages which users can subscribe to when their manufacturer provided warranty runs out.

Global's John Kensington stated that their engineers "are trained up to main frame computers" and are offering a warranty for one year, which covers all electronic components within the computer including the cost of all labour charges. If necessary, the company will replace a computer if it can't repair it. Global charges £16.50 a year for a machine that is up to 24 months old and £20 per year for a machine that is over 24 months old. However, micros that are over 24 months need to be sent to the company to ensure that they are in "working condition".

The company will also repair micros that are already faulty, but again these must be sent to the company so that an appraisal and quotation can be obtained. For further details contact Global Computer consultants at Charles House, Bridge Road, Southall, Middlesex UB8 4BG, telephone 01-571 4411.

Micro Repair is offering a similar service for £24.95. Per-annual cost after the first year is £14.95, though the company is offering a four year subscription for £57.95. The maintenance work will be done by Computerised Services, part of the Thom EM Information Technology Division.



Micro Repair also has a schools scheme whereby a school with more than one micro can join the club for a membership of £24.95 for the first micro and £19.95 each for all others. Further information about the warranty service can be obtained from Simon Jamison, Micro Repair Club, Swan Court, Marnel Road, Wilmore, London SW19 4AA, telephone 01-848 7777.



THE SCP-800 printer/plotter manufactured by Japanese firm Sakata Shokai is the first colour printer/plotter to retail for under £200 according to Kevin Leaper, technical director of Datafax — the UK distributors of the SCP-800. The printer has a standard Centronics interface and as should, according to Kevin, be compatible with the Dragon, though no tests have actually been made. There is also an RS-232C adaptor option. The printer/plotter has A4 paper handling capability and a 210mm paper roll option. The recommended retail price is £199 though at present it is selling at an introductory price of £179. For further details contact Datafax at Colston House, Mount Road, Kingtonloke, Nanty P027 3JX, telephone 0258 464767.

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Nationwide network

Gordon Ross details the growing Users groups, including the latest national Dragon club

A MIB national Dragon User group has been set up following the demise of Dragon Data, Dragon Dungeon and Computerhouse UK (formerly Games and Computers) each with their own newsletter/magazine.

The club has, as yet, no name, but with 250 members and half a dozen enquiries per week it is well on its way to becoming established. Negotiations are currently being made with a number of software firms regarding the possibility of the group offering discounted software. At present, there is a 30 per cent discount on titles produced by Snap Software, and it is hoped that both Microdeal and Touchmaster will be making their range of software available to group members at a 10 per cent saving.

The group is also consulting with Commodore Computers about the possibility of obtaining the 2,000 list of members that Commodore obtained from Computerhouse UK. Below we publish an extract from the editorial of the group's first newsletter.

The users group is being formed due to the demise of both Dragons Teeth and Dragon Data. Our beloved box of rocks is now in the hands of the perfidious Spanish and it was thought that some sort of voice was needed to promote our interests and exchange information. Which brings me to the main message of this editorial, any club — and especially a national one — can only survive with a large and active membership. THIS MEANS YOU, so if you have any problems, opinions, comments or contributions write in, also if you know anyone with a Dragon persuade them to join up, in short go forth and multiply.

Subscriptions for this year is set at £7.50, this may seem a bit steep, but with the club relatively small, costs are high, however next year we hope to be able to drop the price.

There has been some interest expressed in networking either by modem or RTTY, if anyone has views on this, or already possesses the equipment, let me know and I'll pass it on. That's enough from me, at least waiting this hot, so remember from here on in it's down to you.

Further details about the club can be obtained by sending an SAE or postage to the following: Jeremy Hoyleland (newsletter editor), 17 Oxford Road, Pimlico-on-Sea, Essex CO19 9HX. Paul Grade (club chairman), 6 Marivino Road, Worthing, Sussex, KP16 3JN. 13 Ray View Road, Coteay Bay, Chislehurst, Essex SS80 8JH ■

Dragon clubnet

Berkshire: Leighton Buzzard Computer Club, Tolpington Leisure Centre, Leighton Buzzard. Small club, meets on Friday 8pm to 10pm — all systems welcome.

Berkshire: J R Griffin wants his small group to get bigger — enter to 1 Garfield Road, Bristol Centre, Slough, Berkshire or telephone Slough 32066.

Brighton: Brighton, Hove & District Club meets every second Wednesday at the Southwick Community Centre from 7.30 to 10 pm — contact the Hon Secretary, 29 Lancelot Villa, Hove, East Sussex BN3 5SD.

Cambridgeshire: 6005 User Group, c/o Paul Hills, 28 Whitton Road, Lutterworth, Cambridgeshire — international postal group.

Devon: Brixham Computer meets every Wednesday evening at the Golden Lion, New Road, Brixham — write to Ian Chappell, 22 Brooklands Court, Brixham, Devon or telephone Brixham 95054.

Essex: Gerard Corcoran, Elphinstone Park Micro group meets every second Monday and has a regular newsletter.

Essex: Doug Baines, Dragon Independent Gamers' Association, School House, Sevenoaks Road, Haywards, Essex.

Hants: David Rogers, Independent Romsey Area Dragon User Group, 184 Penrhyn Lane, North Batesley, Romsey, Hants SO26 5LG — regular meetings held every second and a free fortnightly newsletter is issued.

Hampshire: Paul Kennedy wants to form a Users group. His address is 81 Broadmeads, Arsenal Road, Warr, Hampshire. Telephone Warr 52294.

Lancashire: Malvin Poynton, North West, SO2-80 Users group, 40 Cowden, Westhoughton, Bolton, Lancashire — growing number of Dragon Users, meets every month at Inter-Net Manchester and publishes newsletter.

Lancashire: John Schofield, Blackburn Computer Club, 1 Sutton Street, Penrith, Blackburn — meets every second Monday at 7.30 pm at the Parkland Hotel, Bolton Road, Bolton.

London: 68 Micro Group, 41 Paternoster Road, Haringey, Middlesex — publishes 68 Micro year and meets monthly at central London locations. Write to the group for further details — all 68KX owners welcome.

Northamptonshire: Dragon User Group meets on Mondays at the Congregational Centre, Castle Gate, Northampton — contact Mike Johnson, Rutland, 19 Galsford Close, Bramwell Moor, Beeston, Northampton or telephone Northampton 288581.

Orkney: Tony Webb, Orkney Computer Users' Society, Colburn Community Centre, Dunbar Street, Wick, Orkney — all user club including 85 Dragon owners.

Staffordshire: Tony Blackwell, Tame Computer

Club, 47 Adams Close, Tarnworth, Staffordshire — an all-user club including 16 Dragon owners, meets fortnightly.

Sunderland: Peter Thakolera would like to set up a Users' club for Dragon owners in the Sunderland area. Contact Peter on Sunderland 28418.

Worcestershire: English Computer Club meets in the Walnut House of Marbury House on the first and third Wednesdays of each month — contact A R Middleton at 14 Primrose Drive, Cherry Hill Estate, Stratford, Worcester or telephone Stratford 775670.

Yorkshire: OS-6 User Group, 1st Floor, 16 New North Parade, Huddersfield — meets monthly (alternating between a pub and Sheffield City Polytechnic) — contact Richard Crumpton, 101 Harncliffe Valley Road, Rotham, or telephone Rotham 561149.

Channel Islands: Dragon User Group, c/o M J Burtin, Roseville, 54 Peter's Valley, St Lawrence, Jersey.

Northern Ireland: Edward Doak, North Down, Macmillan Users' Club, Bangor, Northern Ireland, telephone 0247-50003.

Scotland: David Anderson, Scottish Dragon Club, 1 Miller Street, Edinburgh.

Scotland: Stewart Hutchinson, 164 Firbank Terrace, Barrow, Glasgow or telephone Glasgow 685918.

Scotland: James Brown, Penrynburg Computer Users Club, 12 Rowan Square, Penrynburg, Glenrobin, Ayrshire — meets every Monday and Tuesday evening from 8.30 to 9.30 pm.

United Kingdom: National Dragon users' group, Non-commercial group with approximately 250 members. Further details from Paul Steele, 8 Navarre Road, Wokingham, Sussex. Send SAE or postage.

France: Stephen Herve is looking for Dragon people to swap ideas and programs with. His address is 1 rue des Phloxes, 98009 Charleville-Mazis, France.

Denmark: Dragon User Club, c/o Kenneth and Tony Christensen, Tuffen 378, DK-5200, Munster, Denmark.

Belgium: Haerlen Van Wamelan, Dragon Users' Club, 3 Lijnwastraat Deventer (Belgium) 8100, Belgium.

Belgium: A. Tinnemans, Rue des Combattants 4, 6110 Montigny-Le-Tilleul, Belgium — operates a small Dragon club of about 20 members.

New Zealand: B G Cook wants to start a Dragon and Commodore Computer Users' club — his address is 12 Collingwood Street, Whangarei, New Zealand.

South Africa: Ian McCall invites other 585 Dragon owners to contact him at 35 Silverwood Road, Randburg, Cape Town.

Dragonsoft

New software for review should be sent to: Dragonsoft, 12-13 Little Newport Street, London WC2H 9LD.

Rampage

Program: Manic Miner, Software Projects, The Bear Brand Complex, Allerton Road, Wootton, Liverpool L25 7GF. Price: £5.50.

ONE OF the most popular games to be released for the Spectrum was undoubtedly

screen's include conveyor belts, rampaging beasts and bloodthirsty telepaths. The sound effects are adequate and there's continual musical accompaniment, but as this is the same tune played over and over there is, thankfully, an option to turn off the music.

The only controls you have are left/right and jump, the keyboard is used and is un-

game as there is no way to avoid them, or to predict where and when they are going to appear.

The program supports a pause facility and pressing break restarts a game, but the program performs a "load state" on reset. Why can't programmers start their program with a ROP and set \$75/73 (the reset vector) to this start address? It would save a lot of jangling and would offer more protection as the "load state" poke can be recovered

from very easily, and if the program, like this one, needs to be EXECuted after loading is pretty becomes very easy.

To summarise, a very good game, named, though not beyond reproach, by basic design faults. It is surprisingly addictive and is yet another case of a simple concept being a good one. Well worth adding to your collection.

Jason Orban



Manic Miner; now Roy Coates has converted this game to run on the Dragon and it looks to be just as good on this machine. The only real difference from the original version is that the graphics are all black and white. This was a necessary drawback to maintain the same resolution as used on the Spectrum.

The object of the game is to guide miner Willy through the 30 screens, collecting objects as you go. The various

usually responsive; however, not including a joystick option these days seems rather strange.

This is a faithful reproduction of the Spectrum version and the fact that the graphics are black and white doesn't detract from the real appeal of this game — one for the collection.

Brian Cudge



Back and forth

Program: Boris the Bold, Baby Computer Games, 10 Crossways House, Lutterworth Road, Bletby, Lutterworth. Price: £1.99.

THE IDEA of this game is to get Boris down to the bottom of the screen through the holes that move backwards and forwards on the platforms while avoiding the various patrolling objects and collecting the diamonds for bonus points. The move from top to bottom must be made in a certain number of seconds (20 on the first screen, increasing by five on successive screens).

The game plays well, the response is good, the graphics move smoothly and the sound is the best I have heard on any Dragon game. However, unfortunately, the

program has several blemishes that spoil its perfection. At the beginning of each go the score and lives are shown for a second. This shows bad programming technique. Also, one of the hazards is what are called "Energy Barrels". These appear randomly on one of the levels and kill you if you happen to be where they are. They successfully remove 50 per cent of the skill in the

Money Jump

Program: Cashman, Microdel, 41 Trent Road, St. Austell, Cornwall PL25 5UE. Price: £3.00.

MANY so-called two-player games merely allow you to take it in turns to combat the opposition. Cashman is one of the few games where both players can battle it out on the screen at the same time.

The object of this entertaining program is to collect as much money as you can while avoiding the strange creatures that also inhabit the screen. At the start you can choose to control the sailor, who looks remarkably like Popeye, or the Sheik, or both of them if you have a partner, when you both try to collect more than the other.

Each location contains several conveyor belts and trampolines as well as carefully placed dollar signs. If you jump at the right time, the money is added to your total; when all the dollars have disappeared from the screen, a new location appears. Some of the animals you meet are friendly, such as birds that can fly you to the top of the dis-

play, but look out for cats who reduce your length of time in the game, as well as bombs and apples that descend on you with little warning. As you complete one screen, another appears that increases in difficulty, but if you prefer, you can choose at the start where to begin your challenge and miss out the easy screens.

The concept of the game is good, and in spite of the fact that the figures are difficult to control, it isn't too hard to get a high score. If you choose a late entry point in the game, however, it gets a lot more difficult, with ramps appearing



out of nowhere and worst of all, the loss of your ability to jump. This is the first time I have seen this arcade game on a home computer, and Microdel appears to have a winner that should while away many an evening.

John Searles



Bulls eye

Program: Darts, Baby Computer Games, 10 Crossways House, Lutterworth Road, Bletby, Lutterworth. Price: £1.99.

DARTS is a computerised version of the popular pub game. Up to nine players can take part using one or two joysticks. A variety of games are

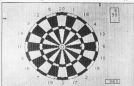
possible — 301, 501, and 1001, each with or without a double to start. There is a choice of nine difficulty levels which range from easy to impossible. An extra feature is the "own game" option which allows players to score for themselves or play some of the more unusual darts games sometimes found in pubs and clubs.

The darts are aimed by moving two pointers, one at



the top of the screen and one on the left. The intersection between the two pointers is where the dart is thrown when the fire button is pressed. If

play a computer game, and at £1.99 it's certainly cheaper than a dartsboard. However, Darts is a competitive game and so loses all of its appeal



the player takes too long at aiming the dart, it is thrown automatically. The program displays each dart's score as well as the total left 'to get', and before each turn, the player is reminded of his/her current score.

Darts is a well-thought-out game, ideal for those occasions when bus-loads of friends turn up demanding to

play a computer game, and if only one person. It's a pity that the writer didn't include a 'computer versus player' option which would increase the appeal of the program. That aside, it's a good game, and most represent excellent value for money.

David Rowlinson



Egg waves

Programs: Damon Seed, Microdeal, 41 Truro Road, St Austell, Cornwall PL26 5AE. Price: £4.99

AFTER many novel ideas, it seems a little strange to find Microdeal releasing a game as long in the tooth as this one. Based on the arcade favourite of two years ago, Phoenix, this is a well-written machine code version that seems heavily influenced by Hitchcock's masterpiece, the Birds. Only the graphics have been changed to protect the innocent.

The game starts with the traditional picture of Outback gaming machinery as the rest of the program loads. There's enough time to go and make yourself a cup of coffee while this happens, and as you return the title frame appears together with the option to choose a black, buff or green background. There are no skill levels to choose from, and the first few frames present no great difficulties.

The theme is saving your base from alien destruction, this time in the form of a demonic foe that gathers at

the top of the screen. The odd seismic budge or two breaks off from the mob and escapes down to you as you blast away with your laser or move left and right to avoid it. If you succeed in destroying a sufficient of these monsters, another wave appears followed by a squadron of cosmic eggs. These present more of a challenge, as they hatch out into ugly demons that need to have both wings and body destroyed before they disappear completely. Simply shooting off the wings results in a Phoenix-like reincarnation as another egg appears on the screen.

This is followed by other waves of eggs in different formations that prove rather more difficult to shoot down and occasionally the creatures fly up from below to catch you unaware. If you manage to survive this screen, you are soon offered the opportunity to destroy the mother ship.

In spite of a few reservations when I first played the game, I can see that Damon Seed has additive potential, although it's hardly the most innovative program of the year.

John Squires



Laser racer

Programs: Time Bandit, Microdeal, 41 Truro Road, St Austell, Cornwall PL26 5AE. Price: £3.99

THIS is a graphic adventure game that is in some ways similar to Touchstone, also from Microdeal. The initial display shows you some of the evil creatures you may meet on your way round the game as you attempt to collect a quantity of treasures.

There are many different locations in which the game is



played; the difference is that the locations are not reached by travelling logically from one to the next, but by entering



title time portals in the second frame and progressing through different mazes. You have a laser with which to protect yourself against the nasty things that live in the maze, but you are also racing against the clock to reach a key hidden somewhere in a tunnel that leads you back to the start with the treasure.

Playing the game reminded me a little of Jet Set Willy for the Spectrum, although each location takes up more than a whole screen, and words readily to the left or right according to your movements. Each time the game is played, you pick up more ideas on how to reach the keys and treasures in less time, and manage to explore more places.

This game involves many skills, not just fast joystick fingers, and should appeal to a wide range of users.

John Squires



Gobble up

Programs: Back Track, Incentive Software, 54 Lancelot Street, Reading RG1 4SQ. Price: £5.50

EGGDS is here! — Eddie being the name of the latest 'computer' from Chris Andrews of Incentive Software. Developed exclusively for the Dragon, this 100 per cent machine code high-resolution graphics game follows the fortunes of our hero Eddie as he explores a rambling labyrinth of interconnected rooms in an attempt to find the keys to the escape door. To aid him in his search is a map showing the plan of the maze, as well as

although there can be over-coming with care. There are also other 'monsters' lying in wait, but I won't deprive the reader of the pleasure of discovering these by mentioning them here. Unlike some games that are so fanatically difficult that the novice is likely to become easily discouraged, this game can be played in its early stages at a quite reasonably pace, but, there is more in store!

There are no less than five mazes of increasing complexity, through which Eddie must be guided, using the cursor, or other user-definable keys. Complete all five, and answer the question on the competition form enclosed with the cassette and you stand a chance of winning a £500 disk drive system.

However, the most remarkable feature of this game is its three-dimensional display with some impressive changes of perspective as we move around taking a 'bird's-eye' view of Eddie's peregrinations in and out of the mazes.

One minor tap — a joystick option would have been welcome but overall an excellent adventure of a realistic price.

Gordon Lee



items of food which he needs to top-up his energy reserves.

Unfortunately, there are also skeletons of previous victims to sap Eddie's strength, and spaces in his path to gobble him up completely.

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THE CHIP SHOP

Keith and Steven Brain put you in touch with the Chip Shop with a look at two Basiccode programs

ONE OF the current growth areas in microcomputing involves linking users together into various forms of network where they can transfer information and programs between their machines. Where the niceties involved are of the same type this is relatively simple, but trying to get two different theories to converse can be rather like working for ACAS.

On the radio

Much has been written about Prestel and the "teletext" systems by which you can "buy" programs via your telephone and services such as Monnet and Compunet, but the developments in transmission of computer programs direct to the user by radio wave have had much less exposure. These are in many ways more interesting and exciting, not least because such programs are free to anyone who has a good old-fashioned "steans radio".

Those of you who listen to the BBC's regular Chip Shop program will probably already know the origin and purpose of the Basiccode system, but for those who seek more audio entertainment we will briefly explain its development.

Way back in the dim dark beginnings of home micros (1976) the Dutch domestic radio service — Nederlandse Omroep Stichting (NOS) — first experimented with transmitting a computer program over the air. This proved technically successful and they therefore proceeded to regularly transmit programs on their weekly "Hobbycoop" program. Some readers may also remember a test transmission made by the BBC TV "Tomorrow's World" program consisting of short Apple and ZX81 programs.

Although the transmitted audio tones could be received accurately there were still a number of problems — not least of which was the fact that ordinary listeners complained about the terrible "interference" they seemed to be receiving. More seriously the value of the transmissions was very limited since almost every machine has a different cassette interface, so that any particular broadcast was only potentially useful to a small group of people (this will be obvious to anyone who has listened to the various weird and wonderful tones produced by tapes for different machines). In addition it is not enough for the machine to be able to recognise that a signal is arriving at its cassette interface, as it must be able to translate this audio tone into a machine-readable format and then into a Basic program.

Although Basic is often seen as the

computer-equivalent of "English" it's dialects are so many and varied that it reminds us of the quotation "England and the USA — two nations divided by a common language". Although it is a relatively simple matter to transmit data from one computer to another by the RS232 protocol this does not automatically provide conversion between different dialects of Basic. Even where a listing of the same program on different machines looks the same the internal representation ("tokens") may be different.

A Dutch radio amateur named Klaus Peters came up with the idea of a new independent code system which could be both "read" and "written" by a whole range of home computers. In this way a single broadcast could be simultaneously used by a range of machines. This idea was taken up by an interested group of users and thus Basiccode was born. The system is often described as "Computer Browsers" but as it represents an artificial language which has had rather limited success, whereas Basiccode is essentially a subset of Basic with a restricted vocabulary, we feel that "Piggin Basic" describes it rather better.



Barry Horner, presenter of *Radio 4's Chip Shop*.

Further developments of the original idea have produced improvements and expansion of the system which has now passed through BASICCODE2 to BASICCODE3+. The system has attracted international interest and in addition to the Dutch broadcasts, Basiccode programs are transmitted in the UK, USA, Canada, Australasia and throughout Europe.

To use the Basiccode system you need to buy a special Basiccode translation program for your computer. The major issue of Basic is the BBC's Chip Shop program, through Broadcasting Support Services, its new BASICCODE2+ package provides a single tape containing suitable programs for no less than 10 different machines including, at last, the Dragon 32 and 64.

Providing the whole galaxy of programs

on a single tape provides good value for money and fortunately the Dragon version is the first program on side 2, so that it is easy to locate. In addition to the tape a comprehensive 71 page manual is provided which gives a good introduction to all aspects of BASICCODE.

The standard of this documentation is good, and should reduce most software (and hardware) manufacturers to sackcloth and ashes. Not only are the workings of all the versions of BASICCODE explained but full details of the standard and how to write your own BASICCODE programs are included.

In competition with the BBC version is an "alternative" offering from Mike Ratty of Grosvenor Software. The current version of this only allows you to load BASICCODE programs, but further developments are in progress and it has a number of additional useful features which are described below.

Two tones

Two tones are used to record data onto the cassette at a baud rate of 1200. A logical "0" is defined as one full cycle of 1200 Hz, and a logical "1" as two full cycles of 2400 Hz. The transmission sequence is:

- 1 startbit (logic '0')
- 8 databits (most significant first)
- 2 stopbits (logic '1')

and a Basic program is coded in ASCII characters and not as the tokens used internally by the computer.

A checksum is included to detect errors in transmission. This works by performing an "exclusive-OR" on all the previous bytes in the block, and warns you if an error is present. If such errors are minor they may possibly be corrected by LISTING and EDITING the converted program. Once a program has been translated to Dragon Basic it can be saved and RUN in the normal way.

Both the BBC and Grosvenor packages are machine code routines loaded by the usual CLOAD command, and built in to the Dragon 32-res graphics pages. As they start on page 2 they do not interfere with DragonDOS and either program can easily be transferred to disk.

As the graphics pages are occupied the normal screen enhancers such as "Rainbow Writer" or "Dorbin" cannot be used at the same time as BASICCODE (although they can usually be used in conjunction with converted programs).

A number of standard Subroutines are an essential part of Basiccode and the functions of these are included as part of the translation program standard. They ■

—very between the two packages but essentially they adjust for the different ways in which the various Basic interpreters carry out a number of common tasks (see Table 1).

Lowest denominator

The main limitation of Basiccode is that it has to take the lowest common denominator of the Basic of all the popular machines. This unfortunately means that the specialised sound and graphics facilities of particular machines cannot be used and you are therefore effectively limited to transmission of text.

The Basiccode standard assumes a 40 row by 24 line screen, which obviously creates difficulties for the Dragon. Grosvenor Software has come up with one answer to this in its Basiccode offering which allows you to see a 32 by 16 scrolling window on the total screen. It is also working on an alternative display which will use the hi-res graphics to produce the full 40 x 24 screen. As mentioned above it is possible to use one of the commercial hi-res displays since the program has been "crunched" into Dragon Basic, so that the limited display is really only a short-term problem.

The first step when reading Basiccode is to decode the signal from the tape, and the second is to convert this into Dragon Basic format. The BBC version is very useful in that each character is displayed on the screen as it is received, so that errors in transmission are easily seen. This means

it very easy to set the correct volume level and so on. On the other hand the conversion routine also provides a running display, so that this part of the system is much slower than that of the Grosvenor version.

One disadvantage of the original Grosvenor program was that it gave up if it detected an error — so that a bad tape or transmission could be totally beyond salvage — but the latest documentation provides some useful PCRs which allow you to attempt to resummed "mysteri-

ously" is that it also allows you to convert Dragon programs to Basiccode standard so that you can inflict them on your friend's machines, although Grosvenor apparently also has this side of things in the pipeline. As the Grosvenor version uses a machine code subroutine in its "FORMAT NUMBERS (PRINT USING)" routine it must be present when programs using this facility (GOSUB 210) are RUN, which can be rather a nuisance.

Isomomms

The BBC "Takeaway" service may be free but it rather assumes that computer users are either isomomms or have a time controller on their tape recorder. The BBC have made much of their recent realisation of transmission times from around midnight to 5.35 am (guys) on Saturday and Sunday mornings but we are not sure if that is meant as a bad joke.

As we said before Basiccode drops you down to the lowest common level, although the programs available may still be very interesting. Getting into Basiccode does not need an arm and a leg, is certainly cheaper than buying a modem, and will not send your telephone bill into orbit. So what have you got to lose if you give it a try?

Subroutine	Purpose	Dragon equivalent
GOSUB 188	Clear screen	CLS
GOSUB 119	Position cursor	(PRINT at)
GOSUB 126	Find cursor	(PRINT)
GOSUB 281	Key pressed?	INKEY
GOSUB 210	Wait for key press	
GOSUB 258	Stop	END
GOSUB 260	Random number	RND(1)
GOSUB 278	Random int	INT(R)
GOSUB 388	Number to string	STR\$(N)
GOSUB 318	Format number	PRINT USING
GOSUB 288	Output to printer	PRINT#2
GOSUB 288	End line	

Table 1: Basiccode subroutines.

ounded" transmissions. On the BBC version you can easily toggle the MOTOR and AUDIO functions on or off by pressing a single key. In short the BBC is better if you are a novice and want to see what is happening, but the Grosvenor version gets you to your objective much faster if you already know that your recordings are OK.

One major advantage of the BBC ver-

Basiccode, Grosvenor Software, 27 Grosvenor Road, Seaford, East Sussex BN25 2BS. Price £3.99 ex VAT.
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10000011	£10.00	£10.00	£10.00
10000012	£10.00	£10.00	£10.00
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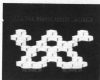
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Bookbytes

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Book: *Brain teasers for the Dragon 32*

Author: Genevieve Ludinaki
Publisher: Phoenix Publishing Associates
Price: £5.95

REVIEW: ARI is a number of programmes covering an assortment of novel ideas, mainly of an educational nature, which are able to test our skills at mental arithmetic, observation, creating number codes, and finding our way through a couple of mazes — as well as a couple of mini-adventures thrown in.

Armed mainly, I would think, at primary and secondary levels, the 20 routines are fairly simple and have been covered for the Dragon from material in companion volumes for other models.



Unfortunately, it is in the conversion that problems arise. In order to use the character set in the hi-res mode, most of the listings contain one or two different sub-routines, each of the two conversions having used his own (different) routines. The length of the listings could have been reduced quite dramatically if they had agreed to use just one routine throughout, and had typed it just once at the beginning of the book, rather than repeating it in full in each program.

Indeed, a number of the programs would have been as effective — and much simpler — in low resolution graphics, and one or two might well have been omitted altogether. In particular, a "who-dunnit" mystery which turned out, rather disappointingly, to be

an over-elaborate word matching exercise.

Illustrations which do not always match the listings, a number of typographical errors, and some rather quaint grammar give the impression of a hastily put together book. In particular, the author recommends that the HiM statements be omitted to increase speed. My advice is don't as most SIOGIOs and SIOGUMs are addressed in these lines and without them the programs will not run at all.

Gordon Lee

Book: *Giant book of games for your Dragon*

Authors: Tim Hannell, Alan Blackburn, Roger Bush, Peter Young
Publisher: Fontana
Price: £3.95

THERE ARE games to suit every taste in this book by Tim Hannell and friends, ranging from Arcade to Adventure, Gambling to Simulation/role play. Each program has a page or so of introductory text which explains how to play and how the program works. The listings are taken directly from the printer and are very clear, so there should be no problems with typographic errors which have plagued books such as this in the past.



As usual, the quality of the games varies considerably, but overall the standard is quite high and many games utilise the Dragon's high and low resolution screens well.

As each game is individually described, as well as a source

of cheap games, typing in these programs will help you learn much about your computer and how to write programs. There are 28 games altogether, as well as useful appendices on creating moving graphics and error trapping. There is also a glossary of "Computerese" at the end of the book.

The *Giant Book of Games* is of the quality we have come to expect from Tim Hannell, and at £3.95 represents very good value for money.

Brian Cadge

Book: *Dragon Machine Code*

Authors: Robin Jones and Eric Cowell
Publisher: Shire
Price: £6.95

THERE appears to be a third generation of computer books on the market. The first was the "Twenty Tremendous Games for your ..." then, when the publishers realised that people didn't get much satisfaction typing in programs without learning from them, they produced stories of "Learning to program your ..." where they reprinted all the listings and added thinly disguised re-written blocks of the manuals for the subject machine.

Also included was a "breakdown" of the program written at a totally different level to the rest of the text, making it impossible for the beginner to understand how the games worked, but allowing him or her the satisfaction of the painless (albeit useless) "learning experience" provided by such books. The new third generation appears to be showing some maturity, it is of course "Programming Machine Code on your ...".

The book that is the subject of this review appears to have a strange blend of the excellent and the incredibly irritating. The main reason for this is it does not know the average intelligence quotient of its readership. I have been programming in machine code now for a long time, but I found some of the routines that were being used difficult to grasp. This is surely a fault of the text not explaining the listing in enough clarity.

The book contains a reasonably good introduction to programming for beginners, and the authors, Robin Jones and Eric Cowell, have avoided galatrasiation most of the time.

The book provides its reader with a machine code monitor and a good chunk is devoted to high-resolution graphics, including a machine code routine to write text on the high-resolution screen at a tricky (to program that is) 51 by 24 character resolution. This alone makes the book worth consideration.



Sadly, though, the book has some glaring faults. Firstly, far too much emphasis is put on hand coding because, say the authors, assemblers cost too much. There is nothing more off-putting to a beginner than a series of tables and numbers. Also, very little help is given as to why things work, especially when dealing with graphics modes. Tables are given but the descriptions do not help the user to "investigate". Sound is not mentioned at any point, and Binary Coded Decimal appears to have disappeared from the face of the authors' earth.

All things considered, this is a good book to consider if you want to program your Dragon in machine code. However, in my opinion the authors Zak and Rosenthal produce books in a better class and this book is not Dragon specific enough to make it a worthwhile purchase over them. See it before you decide.

Jason Orbaum

Dreaming up Dragon designs

David Sam gives you the wherewithal to create your own designs

MANY GAMES and other programs can be greatly improved and made more interesting by the addition of some good graphics. This is difficult to achieve purely from stringing a few graphics commands together and, by trial and error, finding the correct numbers. Very often a basically good game is ruined by poor graphics.

Designer is a comprehensive program that enables pictures, backgrounds and plans to be quickly and easily drawn. It allows you to access all of the Dragon's excellent graphics capabilities and also the normally missing text on the Hi-res screen.

On this version only the upper case letters and numbers are supported but other characters can easily be added in the necessary module of the program. The program itself consists of a main loop from which the command modules are called. This allows easy debugging and easy extension. Each module is independent and can therefore be modified without difficulty. There are three operating modes — Initiate mode, Design mode and Test mode.

Initiate Mode: There will be a short pause while the variables are being initialised. You will then be asked which IMODE you wish to work in and then which colour set. Next you are asked for the foreground colour.

In this colour modes the other colour defaults as the background colour while in four colour modes you are asked for the colour. The screen then goes into Hi-res and Design mode.

Design Mode: The joystick draws, moving the cursor is the current foreground colour. If the fire button is pressed then it only moves the cursor without affecting the background.

Variables

U,D,R,L Draw in the same direction as the corresponding DRAW statement.

E,F,G,H Commands.

O Enters initiate mode—disabling the current screen.

S Starts the program.

+ Increases the scale factor by one i.e. step by which the cursor moves.

- Decreases the scale factor by one.

O to S Change the current foreground colour to the corresponding number if it is possible.

P Paints the area from the cursor

bordered by the colour given after its calling.

O Draws a circle or an ellipse around the cursor in the current foreground colour depending on the parameters given.

V Displays all the variables that are user controlled.

/ Allows the use of the LINE statement and its options. The two points are positioned by the joystick and confirmed by pressing the fire button.

M Moves an area of the screen of a user defined size and replaces it in one of four of the PUT statement options (excluding NOT). You must define the top left corners of each area in the same way as the "I" command. After both of these commands the cursor is still in its original position.

T Saves the screen to tape.

S Dumps the screen to a printer.

@ Enters test mode from design mode.

There is no delete command as you can erase lines by simply drawing over them in the background colour. The size of an area to be moved can be found by moving the cursor around the area and by also using the "V" command to find the X length and the Y length by the differences between the start and end co-ordinates.

Test Mode: The joystick moves the character position around the screen. The fire button shows the cursor but this affects the background as it flashes between the current foreground colour and the background colour set at initiate mode if the colour at that position is different. The cursor keys set the direction of printing the characters.

Variables

@ Returns control to design mode.

SPACE Prints a space in the current direction.

A to Z and 0 to 9 Print the corresponding character in the current direction.

X, Y These are the co-ordinates of the cursor.

COLOR This is the colour set being used.

FRONT This is the colour that the cursor will draw in and the colour

BACK

SCALE

ANGLE

of the text, (i.e. foreground colour).

This is the background colour chosen in initiate mode.

This is the size of the steps that the cursor moves and the size of the text corresponding to the DRAW statement's "O" command values.

This is the current direction with values corresponding to the ones of the DRAW statement's "A" command.

The variables X and Y only are used in design mode while ANGLE is only used in test mode. COLOR, FRONT, BACK, SCALE all apply to both modes. If the SCALE is too small then the cursor will not move properly. Again, there is no delete command. You can either overwrite the characters in the background colour or else use the "I" command to blank out a character position.

Program notes

Lines

100 to 100

200 to 440

Initiate variables.

Main loop. (Design Mode)

KEYS holds the keyboard input.

The cursor is flashed by inverting the point at X,Y by using the PUT statement and then repeating the process leaving the point the same.

Initiate Mode
Change the foreground colour.

Test Mode
Control loop

Joystick commands.
Check for accommodated characters.

Draw numbers.
Draw letters.

Clear screen.
Increase SCALE.

Decrease SCALE.

Move cursor and show in background colour unless blank movement is specified.

Convert the joystick input for drawing.

Paint the area around the cursor

Use the LINE statement.

1000 to 1040

2000 to 2040

3000 to 3070

3080 to 3090

3070 to 3110

3120 to 3210

3220 to 3310

3320 to 3570

4000 to 4070

5000 to 5050

6000 to 6050

7000 to 7170

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and

9000 to 9050

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11000 to 11200

B&H

Christmas Shopping List 1984

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radio compass, fuel and depth gauges with on-screen displays of ammunition and scores. Realistic explosions and sound effects alongside identification sheet, home-coming display, hat of fame and graphic reward for beating the high-score makes this program a masterpiece. TRY IT!

PROTECTOR

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Somewhere on the edge of the galaxy lies a planet threatened with invasion of alien craft. You are the sole DEFENDER of the human population as you intercept the ships with your sensors to locate and destroy before they carry off your charges to who knows what fate, so they mutate and swarm over the planet's surface.

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240 PUTKEY=CHX,YO,BARRY.MOT,DF,KEYS="" THEN 230
330 IF KEYS="" THEN KEYS="BU" GOSUB 7000 REM CONVERT CURSOR KEYS TO DRAW FORMAT
340 IF KEYS=CHR(16) THEN KEYS="BD" GOSUB 7000
350 IF KEYS=CHR(18) THEN KEYS="BL" GOSUB 7000
360 IF KEYS=CHR(19) THEN KEYS="BR" GOSUB 7000
3920 IF KEYS=CHR(20) THEN DRAWARC=STR$(9000-POS(0)-FOR 0=0 TO 250 NEXT 0)-DRAW"LC"+
STR$(POS(0)-REM FLASH CURSOR
3930 IF KEYS="" OR KEYS=CHR(12) THEN 3950
3950 GOSUB 3070
3970 IF KEYS="B" THEN DRAW"#####" +STR$(POS(0))
3980 IF KEYS=CHR(21) THEN DRAW "#####" +STR$(ANGLE)
3990 IF KEYS="L" THEN DRAW"#####" +STR$(POS(0))
4100 IF KEYS="C" THEN DRAW"#####" +STR$(POS(0))
4110 REM

```

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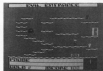
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Screen Edit

From Wayne Smithson in Leeds

THIS PROGRAM is a full screen editor to edit graphics characters and allows you to create graphics screens to be loaded in before your own programs. The program is easy-to-use provided the instructions are read carefully. This way is much better than writing a program with endless data statements full of numbers to be POKED or PRINTED on the screen.

You can create eight screens at once and store them; copy screens; save all eight or just the finished screen to tape; load them back in again to carry on editing; choose any character in any colour; draw and erase; move around all the screen quickly and if everything goes wrong you can clear the screen and start again.

Program notes

The following instructions are to help you use the program efficiently and they sound complicated at first but as you use the program they will become clearer. Arrow keys — Move cursor around the

screen at high speed

Clear key — Clears the screen to the background colour chosen (default=black).

B — Background or border choice. Allows you to choose any colour background (including multi-coloured) or any character border (in any colour).

C — Character choice. Allows you to pick any character from a set by using left and right arrow keys to choose character. Press spacebar when you have selected the chosen character.

D — Draw character chosen in "C" on screen when you move around the screen. This also allows you to rub out by using "D" (see G).

E — Erase. This doesn't actually erase but is used to get out of DRAW mode. This changes the cursor back into a "spite". You will then be able to move around the screen without actually doing anything.

F — Finished editing. This will take you out of editing mode and you will be faced with another menu. Follow the menu's instructions carefully.

G — Get rid of character! Erase if you like. This is only effective in DRAW mode and erases characters as you move. Typing "D" again will put you back in draw

mode. Using "E", "D", "G" you can create pictures very quickly, draw broken lines and so on.

L — List out menu. There is a mini-menu that you can look at while editing that should jog your memory if you forget any commands.

M — Move screen. This allows you to shift the whole screen (except borders) to either the left or to the right. For example, if you drew a picture on the screen and it wasn't in the middle, you would use this to move it.

S — Screen change. This gives you a choice of two coloured screens. There is green (just) or orange (screen 0.1).

T — Test on screen. This allows you to place text on the screen in inverse video or normal. Any text in inverse video must be placed inside " " e.g. HENRY WOE 1985 1985 would be placed on the screen in inverse video.

Should anyone have any problems with the program, I would be glad to help, and also, I realise that there is a lot of keyboard beating to be done before you can use it so I will gladly send the program for you for a small fee if you send an SAE, a cassette and £1 to the following address: Wayne J. Smithson, 24 Coldwell Green, Barnsley.

```
10 *****
20 ** SCREDIT SCREEN EDITOR **
30 *** **
40 ** WRITTEN BY: **
50 ** WAYNE J. SMITHSON **
60 *****
70 ** (C) 1984 W.J. SMITHSON **
80 *****
90
100 GOTO130
110 IF ED="D" THENY=2
120 RETURN
130 PCLCAR=CLARE500,31999;SG=128;
EDB="E";DB=143;S=1634;SC=3;SOUNB1,
1;FORS&H7FFE,51 1;FORS&H7FFF,5H00;
GOSUB660
140
150 CLS:CLS:PRINT"TO MAKE SURE"
160
170 CLS:PRINTB&4,STRINB(132,42);**
** SCREDIT - SCREEN EDITOR. ****
***** WRI
```

```
TTEN BY WAYNE J. SMITHSON *";STRIN
B(132,42);SCREDO,1
180 FORM=1;TOS=EXEC32000;NEXT:PRINT
6384;"SCREEN EDITOR BY W.J. SMITH
SON";SCREDO,1;FORM=1;TOS=EXEC3200
0;NEXT:FORM=1;TOS=PRINT#480;"EXE
C32033;NEXT:GOSUB770;GOTO500
190 EXEC32100;CLS:PRINTB&4,"DO YOU
WANT:-""(1) SCREEN 0,1""(2) S
CREEN 0,0""ENTER 1 OR 2--";
200
210 SEE YOU JIMMY!
220 I GI YA RUN W! THE HED!
230
240 GE=INKEY;IFGE="1" THENEXEC321
50;SCREDO,1;S=1;RETURN ELSE IFGE=
"2" THENEXEC32150;SCREDO,0;S=0;RE
TURN ELSE240 250 EXEC32100
260 CLS:PRINTB&4,"DO YOU WANT:-""
(1) BACKGROUND""(2) BORDER""(
3) GO BACK TO EDIT MODE""OPTION
--->"
Continued on page 21
```



```

270 Q$=INKEY$:IFQ$="1" OR Q$="3" T
HEN270 ELSEPRINTQ$:IFQ$="3" THENEX
EC32150:GOTO310
280 IFQ$="1" THEN330
290 CL$:PRINT"background set":PRIN
T"PRESS THE @ KEY WHEN YOU SEE THE
BACKGROUND THAT YOU WANT      M,
B, destroys present screen":GOSUB7
50:FORM=OTOB:N=0:CL$:G$:PRINT#400,
C$10:
300 N=N+1:Q$=INKEY$:IFQ$="B" THEN3
10 ELSE IFN<100 THEN300 ELSE NEXTB
:Q$=Q$:PRINT#400,"":FORM=14370255STEP
14:PRINTSTRING#(32,N):NEXT:FORM=2
370T0143STEP-14:PRINTSTRING#(32,N):
NEXT:PRINT#400,C$(B):N=0
310 Q$=INKEY$:IFQ$="B" THEN320 ELSE
ENH=1:IFN<100 THEN310 ELSE260
320 W1=B:CL$:Y=0:PRINT"YOU CHOSE "
C$(W1):FORM=OTOFY:NEXT:IFW1<9 THE
NCL$(W1):Q$=PEEK(1111):GOTO310 ELSE
PRINT#400,"":FORM=14370255STEP14:P
RINTSTRING#(32,N):NEXT:FORM=2370T
0143STEP-14:PRINTSTRING#(32,N):NEX
T:B$=PEEK(1111):GOTO310
330 CL$:FORM=12970143:PRINTSTRING#
(32,N):NEXT:FORM=OTD$:FORM=1024T
0153:POKEX,PEEK(N)+14
340 Q$=INKEY$:IFQ$="B" THEN340 ELSE
ENEXTN,NN:FORM=1024T0153:POKEX,PE
EK(N)-14
350 Q$=INKEY$:IFQ$="B" THEN360 ELSE
ENEXTN:GOTO360
360 Y=0:BO=PEEK(N):SCREEN0,S:EXEC3
2150:FORM=1024T0155:POKEX,BO:POME
N=400,BO:NEXT:FORM=OTD$:FORM=1055
T0151STEP32:POKEX,BO:POKEX+1,BO:N
EXT:GOTO310
370 EXEC32100
380 CL$:PRINT#44,"ENTER YOUR LINE
OF TEXT PUTTING ': ROUND ANY BITS
THAT WANT TO BE inverse video":LI
NEINPUT"TEXT:~":T$
390 PRINT"WHEN YOU GET TO WHERE YO
U WANT TO PUT THE TEXT THEN PRESS
'P' FOR PUT, IF YOU WANT TO RUB
IT OUT AGAIN, PRESS 'R' FOR ERASE
":GOSUB750:SCREEN0,S:EXEC32150:G
OTO310
400 IFY$="" THEN 510 ELSEEXEC32100
410 CL$:LL=LEN(T$):L=LL:FORM=1TOLL
:IFRIDE(T$,N,1)=" " THENL=L-1:NEXT
ELSENEXT
420 IFX=LL:1535 THENPRINT"NOT SUFF
ROOM ON SCREEN FROM HERE.....TR
Y AGAIN":GOSUB750:SCREEN0,S:EXEC32
150:GOTO310
430 T1$="":EXEC32150:FORM=X+1 TO X
+L:T1$=T1$+CHR$(PEEK(N)):NEXT:L=L
EN(T$):FORM=1TOLL:IF RIDE(T$,N,1)=
" " THENIF2=0 THEN3=1:NEXT ELSE2=0
:NEXT
440 IF2=1 THEN22=64 ELSE IF2=0 THE

```

```

N22=0
450 IF RIDE(T$,N,1)<"B" AND 2=1 TH
EN22=0:GOTO480
460 IFRIDE(T$,N,1)<"B" THEN22=64
470 IF NULL THEN0=0:GOTO310
480 B=0+1:POKEX=0,ASC(RIDE(T$,N,1)
)-22:NEXTB=0:GOTO310
490 IFY1$="" THEN510 ELSE IFORN=1T
OLEN(T1$):POKEX=N,ASC(RIDE(T$,N,1)
):NEXT:GOTO310
500 CL$:PRINT"YOU ARE NOW IN EDITI
NG MODE.....":EXEC32000:EXEC32150
510 GOSUB110:Q$=INKEY$:IFQ$="" THEN
500ELSEIFY=2 THENPOKEX,CH ELSE POK
EX,P
520 IF Q$=CHR$(12) THEN IF W1<9 TH
ENCL$(W1):B$=PEEK(1111) ELSE2=9:G
OTO320:B$=PEEK(1111)
530 IFQ$="B" THEN250 ELSEIFQ$="L" G
OSUB770 ELSEIFQ$="T" THEN370 ELSEI
FQ$="F" THEN400 ELSEIFQ$="R" THEN4
90 ELSEIFQ$="B" GOSUB190
540 IF Q$="F" THENEXEC32100:GOTO81
0 ELSEIF Q$=" " GOSUB1030
550 IF Q$="B" THEN ED$="D":GOTO310
ELSE IF Q$="E" THEN ED$="E":GOTO3
10
560 IF Q$="B" THEN IF CH=GG THEN C
H=TE ELSE TE=CH:CH=BB
570 IF Q$="C" GOSUB1050 ELSEIFQ$="
H" GOSUB1100
580 GOSUB110:IFY=2 THENP=PEEK(X):P
OKEX,CH:Y=0 ELSE IF Y=1 THENPOKEX,
P:Y=0
590 IF Y=0 THENP=PEEK(X):POKEX,RND
(2)+149:Y=1
600 IFPEEK(144)<223 THEN620 ELSE
IF Y=2 THENPOKEX,CH:Y=2 ELSE POKEX
,P:Y=0
610 IFX<1535 THENX=X+1:GOTO580
620 IFPEEK(1343)=223 THENPOKEX,P:IF
X<1024 THENX=X-1:Y=0:GOTO580
630 IFPEEK(1341)=223 THENPOKEX,P:IF
X<1055 THENX=X-32:Y=0:GOTO580
640 IFPEEK(1342)=223 THENPOKEX,P:IF
X<1504 THENX=X+32:Y=0:GOTO580
650 GOTO310
660 FORM=32000T032069:READA$:POME
N,VAL("H"+A$):NEXT:FORM=32100T0321
14:READA$:POME,VAL("H"+A$):NEXT:
FORM=32150T032144:READA$:POME,VAL
("H"+A$):NEXT
670 FORM=OTD$:READC$IN:NEXT:RETUR
N
680 '
690 '
700 ' ALTER THIS DATA FOR A
710 ' DIFFERENT PROGRAM!!!
720 '
730 DATA BB,4,0,BA,BA,BB,40,67,BB,
BB,6,0,26,FS,BD,11,BB,4,0,AA,B4,BB
,40,67,BB,8C,6,0,26,FS,BD,1,39,BB,
FF,B7,FF,23,86,CB,B7,FF,20,BB,1,0,
30,1F,26,FC,7F,FF,20,BB,9,73,FF,20

```

Continued on
page 33



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```

,8D,4,4A,2B,E9,39,1F,8F,5A,2B,FB,3
9
730 DATA BE,4,0,10,DE,7F,FE,AA,80,
A7,A0,BC,6,0,2B,F7,39,DE,4,0,10,8E
,7F,FE,AA,A0,A7,80,BC,6,0,2B,F7,39
740 DATA BLACK, GREEN, YELLOW, BLUE, R
ED, BUFF, CYAN, MAGENTA, ORANGE, MULTI-
COLOURED
750 QA=INKEY$:IF QA<>" " THENPRINT$
40B,"SPACEBAR TO CONTINUE":;SCREEN
0,1:QA=INKEY$:IF QA<>" " THENPRINT$
40B,"spacebar to continue":;SCREEN
0,1:GOTO750
760 RETURN
770 EXEC32100:CLS:PRINT"=SCREEN ED
ITOR BY W.J. SMITHSON=":PRINT$?1,"
keyboard commands":POKE1103,32:FOR
N=1024TO1055:POKE N,PEEK(N)-44:NEXT
780 PRINT"=BORDER-SET BORDER OR DAC
KROUND TEXT-PLACE TEXT ON SCREEN
CHARACTER-CHOOSE CHR", "GET$
ID=ON/OFF TO ERASE CHR", "SCREEN=C
HANGE SCREEN TO 0,1/0,0 FINISH-FIN
ISHED EDITING? LIST-LOOK AT
THIS LIST"
790 PRINT"=MOVE SCREEN-SCREEN LEFT
OR RIGHTe/d-DRAW OFF/DRAW ON", "cl=
ar-CLEAR SCREEN", "space-CHANGE CHR
# COLOUR"
800 PRINT"=row keys-MOVE CURSOR":
GOSUB750:EXEC32100:SCREEN0,S:RETUR
N
810 CLS:PRINT"=SCREEN EDITOR BY W.
J. SMITHSON", "1=X GO BACK TO EDI
T MODE", "2=X SAVE CURRENT SCREEN",
"3=X SAVE ALL SCREENS (1-0)", "4=X
LOAD SCREEN(S) FROM TAPE", "5=X EDI
T DIFFERENT SCREEN", "6=X COPY SOME
ENV":SCREEN0,1:EXEC32000
820 PRINT$?2,"INPUT CHOICE-->":
830 Q=VAL(INKEY$):PRINT$?3,ON Q GOTO
500,850,850,900,950,1000
840 GOTO820
850 INPUT"WHAT FILE-NAME PLEASE":P
#
860 IF LEN(P#)>8 THENPRINT"NAME TO
O LONG, 8 LETTERS MAX.":GOTO850 EL
SE PRINT"PRESS spacebar TO SAVE"
870 IF INKEY$<>" " THEN870 ELSE IF
Q=2 THEN EXEC32150:POKE1536,PEEK(
1024)
880 IF Q=2 THEN C$A$=P#,1024,153
6,512:SOUND1,10:GOTO810
890 C$A$=P#,1536,13024,12288:SOU
ND1,10:GOTO810
900 INPUT"WHAT FILE NAME (TYPE ext
er to LOAD ANY NAME)":P#
910 PRINT"PRESS spacebar TO LOAD"
920 IF INKEY$<>" " THEN920
930 IF P#="" THEN CLOAD# ELSE CLOA
D# P#
940 POKE$H7FFE,6:POKE$H7FFF,0:IF P
EEK($HFD)=256+PEEK($HFE)=12288 THE

```

```

NCL$PRINT"ALL 8 SCREENS LOADED IN
1:GOSUB750:GOTO810 ELSE POKE1024,P
EEK(1536):EXEC32100:CLS:PRINT"SCRE
EN NUMBER 1 LOADED IN":GOSUB750:G
OTO810
950 CLS:PRINT"YOU ARE ON SCREEN NU
MBER":(PEEK($H7FFE)+256+PEEK($H7FF
F))/1536:PRINT"WHICH NUMBER DO YOU
WANT (1-8)":
960 Q=VAL(INKEY$):IF Q<1 OR Q>8 THE
N960 ELSEPRINT$
970 POKE$H7FFE,INT(10+1536/256):P
OKE$H7FFF,0
980 PRINT"PRESS spacebar TO SEE SC
REEN":Q
990 IF INKEY$<>" " THEN990 ELSE EX
EC32150:FORM=102099:NEXT:GOTO810
1000 PRINT"COPY WHICH SCREEN-->":
1010 Q=VAL(INKEY$):IF Q<1 OR Q>8 T
HEN1010 ELSEPRINT$PRINT"TO WHICH
SCREEN-->":
1020 Q1=VAL(INKEY$):IF Q1<1 OR Q1>
8 THEN1020 ELSEPRINT$POOPY Q TO
Q1:PRINT"THIS DONE 'O GREAT ONE!":
GOSUB750:GOTO810
1030 CH=CH+16:IF CH>255 THEN CH=CH
-128 1040 RETURN
1050 EXEC32100:CLS:NN=128:FORM=10
240:GOSST$?2:POKE N,NN:NN=NN+1:NEX
T:AR=1056:PRINT$?24,"PRESS 'C' TO
CANCEL THIS MODE.",
1060 POKE AR,94:QA=INKEY$:IF QA=CH
AR(8) THEN IF AR=1056 THEN POKE AR
,175:AR=AR+2:GOTO1060
1070 IF QA=CHR(17) THEN IF AR=1086
THEN POKE AR,175:AR=AR+2:GOTO1060
1080 IF QA="C" THEN EXEC32150:RETU
RN ELSE IF QA<>" " THEN1060
1090 CH=PEEK(AR-32):PRINT"REMEMBER
TO PRESS THE SPACEBAR TO CHANGE
COLOUR, IT IS NOW GREEN":GOSUB750:
EXEC32150:RETURN
1100 EXEC32100
1110 CLS:INPUT"PRESS 'C' TO CANCEL
THIS MODE MOVE LEFT OR RIGHT":L
#
1120 IF LEFT$(L,1)="-L" THEN1140 E
LSE IF LEFT$(L,1)="-C" THENEXEC321
50:RETURN ELSE IF LEFT$(L,1)<>"R"
THENGOUND1,1:GOTO1110
1130 EXEC32150:FORM=1:TO15:FOR2=105
4TO1025STEP-1:T3=PEEK(2+NN32):POKE
2+NN32,PEEK(2+NN32)-1:NEXT2:POKE
1025+NN32,T3:NEXTN:RETURN
1140 EXEC32150:FORM=1:TO15:FOR2=102
5TO1054:T3=PEEK(2+NN32):POKE2+NN32
,PEEK(2+NN32)+1:NEXT2:POKE1054+NN
32,T3:NEXTN:RETURN
1150
1160 TYPE "GOTO 500" ON
1170 SET AN I/O ERROR OR
1180 ACCIDENTALLY PRESS BREAK.
1190

```

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Abstract



CHALLENGE



SNOW QUEEN

[illegible]

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Dragon conversion

John Buckley gives the tokens and listings necessary

THE TANDY Color Computer and the Dragon 32 are both based on the 68000 chip. They also share Microsoft Basic when typing Basic programs into either machine (there is no need to change anything for even their screen formats are identical). One might therefore think that a program which runs on one machine could be saved to tape and then run on the other.

However, this is not so. When presented with a tape recorded by one machine when the micro you own is the other the tape will load OK but as soon as you type RUN the only thing you can get out of your busy micro is a syntax error (and there is nothing more frustrating than that).

The problem is that the Dragon and CoCo use different tokens to represent Basic commands. "What is a token?" you ask. When you type in a Basic command it is recognised by all those good little bits in ROM and, rather than storing it as a string of letters in ASCII, it is stored using only one or two bytes of memory. These bytes are the tokens which your micro recognises as Basic commands when you RUN the program. So when you CLDND a program into a CoCo that was CBASEd from a Dragon (or vice versa) many of the tokens will be "misinterpreted".

You can explore the tokens in your micro by typing in listing 1. Program lines 30 to 100 POKe the values 120 to 255 into program line 10, ten values at a time. Line 10 PRINTs the values which were POKEd

and line 90 LSTs program line 10 with the values now represented by the corresponding Basic command. Typing GOTO 100 will cycle through the next ten values. The second half of the program does the same thing for the two byte tokens.

A listing of the tokens for both the Dragon and CoCo, together with their associated commands, is given in table 1. The table is in two parts. The left side lists the Basic commands in alphabetic order with the corresponding tokens for the CoCo and Dragon. The right half of the table lists the tokens in numeric order with the corresponding commands.

Several alternatives

Once you have the tokens there are several alternatives regarding what you can do with them — you can list them in DATA statements, READ them into arrays and then use the arrays as look-up tables. This would occupy a fair amount of storage space (about 3K) which, if you are only translating short programs, may not make much difference.

If you are trying to translate a program which takes up most of your available memory then any trick which saves a few bytes is to your advantage. I chose the memory saving method.

I set up a translation program which allowed me to input the look-up tables, point them out (table 1), save them to tape and read them from tape (see listing 2).

The program is fairly short and user friendly. The results will help you to understand the various aspects of the program. With this program I saved my look-up tables to tape for future use.

One word of caution, the program as it stands is for Extended Basic and Disk Basic. Not having access to a Dragon disk I was unable to determine the tokens for the Dragon Disk Basic commands. For this reason you will find "D" in the token list for the Dragon or "Y" in the keyword list of table 1. If you have a Dragon Disk system you can fill in the empty space using listing 2.

Once you have entered listing 2, type RUN and select option "1" from the menu. You will receive the prompt "TOKEN = ", "ENTER DRAGON KEYWORD." Use the right half of table 1 to enter the correct command which corresponds to the token displayed. When you have entered all the commands the program will return to the menu. You can either print the table to the screen or printer or you can save it to tape.

Having saved the look-up tables my next step was to get them in a more useable and condensed form. Program listing 3 did this for me. It organised the one byte tokens into the arrays from subscript 1 through 79 and two byte tokens in arrays from subscript 79 to 112. It also reduced the token look-up table to eliminate the disk tokens. Of course, if you have the missing disk tokens you will want to save a complete set of tokens. To do this make the following changes in listing 3:

```
40 DIM T(194), TC(194), CT(194),
   DT(194)
```

```
140 POKe=120T(0)34
180 POKe=255T(128)166
260 POKe=170T(38)...
```

The data saved by listing 3 will be used to translate Dragon to CoCo programs or vice versa. Program listing 4 does this. It reads the look-up tables into arrays TC(112) and TD(112) (lines 60070 through 60110), sets the end point for conversion to the beginning of the conversion program DHTOCC (line 60130), and merges the program to be converted with DHTOCC (line 60140) using a program we will discuss shortly. Lines 60150 through 60160 keep us informed of the programs progress.

The actual conversion takes place in the subroutines starting on lines 60200 (two byte tokens) and 60250 (one byte tokens). Lines 60260 through 60340 step through

```
10 DATA 123456789012345678901234567890
20 ST=PEEK(20)16556+PEEK(26)
30 FOR I=128T(0)55STEP10
40 FOR J=0T(9) IF I+J>255 THEN GOTO
50 POKEST+6+2*J, I+J POKEST+7+2*J, 44+NEXT J
60 CLS
70 FOR J=0T(9) PRINT I+J, NEXT J
80 LIST 10
90 NEXT I
110 FOR I=128T(0)55STEP10
120 FOR J=0T(9) IF I+J>255 THEN I=140
130 POKEST+6+2*J, 255 POKEST+7+2*J, I+J
   POKEST+9+2*J, 44+NEXT J
140 CLS
150 FOR J=0T(9) PRINT I+J, NEXT J
160 LIST 10
190 *****
200 ***** CLDND"TOKEN" *****
210 *****
```

Listing 1

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-	172	196
*	173	197
/	174	198
^	175	199
~	176	202
>	179	203
<	180	204
?	191	191

[illegible]

TOKEN	COMMAND	
	COCO	DRAGON
128	FOR	FOR
129	GO	GO
130	REM	REM
131	"	"
132	ELSE	ELSE
133	IF	IF
134	DATA	DATA
135	PRINT	PRINT
136	ON	ON
137	INPUT	INPUT
138	END	END
139	NEXT	NEXT
140	DIM	DIM
141	READ	READ
142	RUN	LET
143	RESTORE	RUN
144	RETURN	RESTORE
145	STOP	RETURN
146	POKE	STOP
147	CONT	POKE
148	LIST	CONT
149	CLEAR	LIST
150	NEW	CLEAR
151	CLOAD	NEW
152	CSAVE	DEF
153	OPEN	CLOAD
154	CLOSE	CSAVE
155	LLIST	OPEN
156	SET	CLOSE
157	RESET	LLIST
158	CLS	SET
159	MOTOR	RESET
160	SOUND	CLS
161	AUDIO	MOTOR

162	EXEC	SOUND	213	MERGE	??
163	SKIPF	AUDIO	214	RENAME	??
164	TAB	EXEC	215	RESET	??
165	TO	SKIPF	216	SAVE	??
166	SUB	DEL	217	WRITE	??
167	THEN	EDIT	218	VERIFY	??
168	NOT	TRON	219	UNLOAD	??
169	STOP	TROFF	220	SKIN#	??
170	OFF	LINE	221	BACKUP	??
171	*	PCLS	222	COPY	??
172	-	PSET	223	SKIN#	??
173	#	PRESET	224	SKIN#	??
174	/	SCREEN	255128	SGH	SGH
175	^	PCLEAR	255129	INT	INT
176	AND	COLOR	255130	ASS	ASS
177	OR	CIRCLE	255131	USR	POS
178	>	PRINT	255132	RND	RND
179	=	GET	255133	SIN	SQR
180	<	PUT	255134	PEEK	LOG
181	DEL	DRAW	255135	LEN	EXP
182	EDIT	PCOPY	255136	STR#	SIN
183	TRON	PROBE	255137	VAL	COS
184	TROFF	PLAY	255138	ASC	TAN
185	DEF	DLOAD	255139	CHR#	ATH
186	LET	RENUM	255140	EOF	PEEK
187	LINE	TAB	255141	JOYSTK	LEN
188	PCLS	TO	255142	LEFT#	STR#
189	PSET	SUB	255143	RIGHT#	VAL
190	PRESET	FN	255144	RID#	ASC
191	SCREEN	THEN	255145	POINT	CHR#
192	PCLEAR	NOT	255146	INKEY#	EOF
193	COLOR	STOP	255147	RCH	JOYSTK
194	CIRCLE	OFF	255148	ATH	FIX
195	PRINT	*	255149	COS	HMS
196	GET	-	255150	TAN	LEFT#
197	PUT	#	255151	EXP	RIGHT#
198	DRAW	/	255152	FIX	RID#
199	PCOPY	^	255153	LOC	POINT
200	PROBE	AND	255154	POS	INKEY#
201	PLAY	OR	255155	SQR	REN
202	DLOAD	>	255156	HMS	VARPTR
203	RENUM	=	255157	VARPTR	INSTR
204	FN	<	255158	INSTR	TIMER
205	USING	USING	255159	TIMER	PPROINT
206	DIR	??	255160	PROINT	STRING#
207	DRIVE	??	255161	STRING#	USR
208	FIELD	??	255162	CYN	??
209	FILES	??	255163	FREE	??
210	KILL	??	255164	LOC	??
211	LOAD	??	255165	LOF	??
212	LSRT	??	255166	MON#	!!

```

60000 '*****
60010 '*** CLOAD"PROG00" ***
60020 '*****
60030 C DPTOK(112),TOK(112)
60040 CLS:PRINT"LOAD LOOKUP TABLE"
        PRINT:2004,"POSITION TYPE = PRESS
        A=any,"PRESS enter TO CONTINUE"
60050 FOR INKEY#="IFN">CHR$(13) THEN 60050
60060 CLS:PRINT"SEARCHING FOR Lookup"
60070 OPEN "1",-3,"LOOKUP"
60080 CLS:PRINT"FOUND Lookup"
60090 FOR J=1 TO 12: PEEKS=1: THEN 60110
60100 INPTR=L: FOR L3: PCLS: NEXT L

```

```

60110 CLOSE:1 Loading 4 lines into Dragon to code programs
60120 CLS:PRINT"LOADING COMPLETE"
60130 G=PEEK(2551255)+PEEK(2551256)
60140 END:60070
60150 PRINT:PRINT"PROGRAM BEING CONVERTED"
        PRINT:120,"START ADDRESS="
        PEEK(2551255) G=PEEK(2551256)+4
60160 PRINT:120,"END ADDRESS=" "EO
60170 PRINT:120,"CURRENT ADDRESS="
60180 GOTO 60050
60190 "Lookup for 2551254 TO 255161
60200 PEEKS=PEEK(112): GOTO 60050
60210 "Lookup for 1254 TO 1255

```

Continuation
page 47

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Print Code

DEALER INQUIRIES WELCOME - TELEPHONE 021-333 1850

```

00200 FORK=1000
00200 IF TOKK=THK THEN TOKK=RETURN
00240 NEXTK=CLS:PRINT"ERROR IN TOKEN
CONVERSION":STOP:RETURN
00250 'main program for conversion
00260 FOR I=PEEK(2510250+PEEK(2610200)+4*000
PRINT3207,I
00270 TK=PEEK(I)
00280 IF TK=THK THEN I=I+4:GOTO00340
00290 IF TK=128 THEN H=H+40
00300 IF TK=255 THEN H=H+255:GOTO00300
00310 IF TK=255 THEN H=H+1:TK=PEEK(I)
CONV=CONV+1
00320 FOR I=TK
00330 CLS:PRINT"CONVERSION COMPLETE.
CONVERSION PROGRAM DELETED.
"PRINT"save converted program."
00340 DEL00200-

```

Listing 8 continued

Listing 9: merge program

```

10 '*****
20 '*** CLORD"MERGE-M" ***
30 '*****
40 CLS:PRINT"load TAPE TO BE CONVERTED.
press any key to run"
50 TYPE:EXEC32749,"PRINT"PRINT"load"
60 CLS:PRINT"255,32749
70 FOR R=32742 TO 32750
80 READ B: POKE A,B: NEXT
90 DATA 128,25,175,148,12,159,37,49,39
99 DATA 32,3,174,148,3,153,23,37

```

```

00000 '*****
00010 '*** CLORD"ORTOCOR" ***
00020 '*****
00030 '*** BY J. NICHOLS ***
00040 '*****

```

Listing 8 00000 'token conversions. The first data element is the code token and the zero
data element is the corresponding drawn token.

```

00040 DATA 128,128,129,130,130,131,131,132,132,133,133,134,134,135,135,136,13
6,137,137
00050 DATA 138,138,139,139,140,141,141,142,142,143,144,144,145,145,146,146,14
7,147,148
00060 DATA 149,149,150,150,151,151,152,152,153,153,154,154,155,155,156,156,15
7,157,157
00070 DATA 158,158,159,161,160,162,161,163,163,164,163,165,164,167,165,168,168,16
9,167,171
00080 DATA 169,170,169,170,170,171,171,172,172,173,173,174,174,175,175,176,176,17
7,177,177
00090 DATA 178,182,179,180,180,181,181,182,182,183,183,184,184,185,185,186,186,18
7,187,187
00100 DATA 188,191,189,192,189,193,193,194,194,195,195,196,196,197,197,198,198,19
9,199,199
00110 DATA 199,199,200,200,201,201,202,202,203,203,204,204,205,205,206,206,207,207,20
8,208,208
00120 DATA 199,199,200,200,201,201,202,202,203,203,204,204,205,205,206,206,207,207,20
8,208,208
00130 DATA 199,199,200,200,201,201,202,202,203,203,204,204,205,205,206,206,207,207,20
8,208,208
00140 DATA 199,199,200,200,201,201,202,202,203,203,204,204,205,205,206,206,207,207,20
8,208,208
00150 DATA 199,199,200,200,201,201,202,202,203,203,204,204,205,205,206,206,207,207,20
8,208,208
00160 DATA 199,199,200,200,201,201,202,202,203,203,204,204,205,205,206,206,207,207,20
8,208,208
00170 DATA 199,199,200,200,201,201,202,202,203,203,204,204,205,205,206,206,207,207,20
8,208,208
00180 'read conversion table into memory
00190 DATA 127,TK(11)
00200 FOR I=10110
00210 DATA 127,TK(1)
00220 NEXT I
00230 'set end point for conversion.
00240 B=PEEK(2510250+PEEK(2610200)
00250 'name program
00260 EXEC32750
00270 CLS:PRINT"PROGRAM BEING CONVERTED"PRINT100,"START ADDRESS"PEEK(25
10250+PEEK(2610200)
00280 PRINT162,"END ADDRESS" B
00290 PRINT3296,"CURRENT ADDRESS"
00300 GOTO00300
00310 'look for tokens in the range of 255 128 to 255 161.
00320 FOR K=PT0112:GOTO00320
00330 'look for tokens in the range of 128 to 255
00340 FORK=1000
00350 IF TOKK=THK THEN TOKK=RETURN
00360 'if add and convert a code token to drawn change line 00360 to read
IF TOKK=THK THEN TOKK=RETURN
00370 NEXTK:CLS:PRINT"ERROR IN TOKEN CONVERSION":STOP:RETURN
00380 'main program for conversion
00390 FOR I=PEEK(3010250+PEEK(2610200)
00400 PRINT3207,I
00410 'read token from address to be converted
00420 TK=PEEK(I)
00430 IF TK=THK THEN I=I+4:GOTO00440 'line end point. Jump to start of next line.
00440 IF TK=128 THEN H=H+40 'not a token
00450 IF TK=255 THEN H=H+255:GOTO00450
00460 IF TK=255 THEN H=H+1:TK=PEEK(I)
00470 'two data tokens. read next token and
convert.
00480 FOR I=TK:change token in address being converted.
00490 NEXT I
00500 CLS:PRINT"CONVERSION COMPLETE. CONVERSION PROGRAM DELETED."PRINT"save C
ONVERTED PROGRAM."
00510 DEL00200-'delete conversion program from memory.

```


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type and will work with most games.



IF YOU'RE an avid reader of classified advertisements, as I am, then you'll have spotted one from a small software house called Nemesis offering an adventure with the strange title *The Trail of Arnold Blackwood*. Intrigued to discover more about the enigmatic Arnold I wrote off for a copy. What came back was a straightforward but interesting adventure, worth checking out, and more professionally presented (in terms of the program if not the packaging) than many other small-scale productions.

Handy addition

The adventure uses its own redefined character set to make the screen lay-out more attractive, though Nemesis says that in order to do this it has to sacrifice a SAVE routine, which is unfortunate. Arnold accepts the usual left-to-right input, with words being recognised by their first three letters, and an unusual addition is that you don't need to type G67 to pick up an object: the program assumes that's what you want to do, unless you specify some other action.

Each place you visit has three headings, which are emphasised in neat little boxes: **LOCATION**, **VISIBLE** and **DIRECTIONS**, which are self-explanatory. What isn't self-explanatory is the purpose of the adventure. You take the part of Arnold Blackwood, and you're suffering from loss of memory. You start in a thicket on the Estate of Lord Greibus and you know you're on some kind of mission... but what? You also know that Lord Greibus has plenty of expensive bodies, so...

The first set of locations has you wandering around outside the house, trying to discover a way through the locked oak door. Searching sheds and other buildings gives you a few tools, while wandering into a greenhouse has you confronted by a troll. If you haven't got the item that puts out the troll, then you're stuck as the greenhouse door closes behind you and as the program doesn't recognise **QUIT**, **END** or similar words there seemed to be no alternative but to **W-LOAD**. Though later I discovered you could **BREAK** and **GOTO 10**, which lets you back to the opening location but with the objects you'd already accumulated still

in your possession. (Though loaded with **CLARADAM**, the program is apparently a mix of Basic and machine code.)

You might bump into a mobile oracle, which gives you advice along the lines of "Don't eat the kipper" or "Donzo is a cat" when consulted, some of which starts to make sense when you enter the house and the adventure begins to open out. You encounter a chambermaid and Mexican Pete, not to mention a ZX-81, and while this is far from being a vast adventure it is puzzling and also includes some amusing responses from time to time. At £5.95 it is reasonably priced and is obtainable from Nemesis at 10 Carlow Road, Ringstead, Kettering, Northants NN14 4DR.

More expensive at £5.95 are two titles in the *Mysterious Adventure* series from Channel 4 and if you enjoyed *The Golden Baton*, which was author Brian Howard's first attempt at adventure writing, you can go on to not only a follow-up with *Arrow of Death*, but a follow-up to the follow-up with *Arrow of Death Part 2*. They follow the format of the rest of the series, having a Dragon 64 graphics version and a Dragon 32 text-only version on the same tape and making use of the small character set which makes the screen look more like a Spectrum than a Dragon.

Now when you acquire the *Golden Baton* at the end of the first adventure (what do you mean, you haven't managed it yet?) you thought your troubles were over. Indeed they were, for a time, till the weather in the kingdom turned bad, the crops began to fail and there was nothing but gloom and despondency all around. The Baton no longer shines like gold, but is tarnished and evil seems to be now associated with it. Your task is to find the source of the evil and the means of dealing with it. You begin in the Palace of the King, where the *Golden Baton* is kept in the Throne Room, though any attempt to do anything with it at first is doomed to disaster... in fact that has to wait till Part 2, as Part 1 merely has you finding what it is that you need in order to deal with the Baton.

As I've said before about this series, they're not to everyone's taste and while I find them enjoyably sticky there are plenty who seem to think they're unbelievably simple. Lucky them! What I like about them

is that everything has a purpose, even though this might not become apparent till much later on in the story. You also get to know which locations are likely to be significant, even if this isn't obvious at first. Find a shovel and you can be sure you'll have to dig all over the place to unearth something useful (this happens in Part 2), and if you **SEARCH** everywhere and **EXAMINE** everything then the means to progress just has to be there.

The text descriptions are kept very brief and there would be a lot more atmosphere about the stories if these were expanded a little, but there are certainly plenty of locations to explore. In the first part you soon leave the Palace behind and start wandering round forests, down cliffs and into caves — by this time you've already discovered that the means to deal with the evil is going to be an arrow, so you're searching for the parts that you'll need.

Seek and destroy

When the second adventure begins, you are armed with a sword and everything you need in order to make the arrow, with which you must destroy Bardon, who is the source of the evil. But the only one who can help you make the arrow is Armit, the Royal Fletcher, so first you must reach Fletcher. The terrain here is very familiar, with narrow gorges, rope bridges, stone corridors and dirty little caverns... yes, the inevitable old lamp is in here, too, and the first with which to light it is hidden somewhere. What would we do without that old lamp?

Characters in the adventure include a sinister guard, a happy mule, an animated skeleton and... well, who's the familiar figure? Yes, it's the old beggar... where do all the young beggars get to, I wonder? But though some of the scenes and tasks are similar to many another adventure, both parts of *The Arrow of Death* should certainly give you your money's worth, like the rest of the *Mysterious Adventures*. Buy them all and then, adventure in your Dragon for many more months to come. ■

Each month Mike Gerrard will be looking at adventures for the Dragon. If you have an adventure you want reviewed or you need advice or have news to offer write to Mike Gerrard's Adventure Trail at Dragon cover.



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Pixel problem

I HAVE encountered a problem in trying to move shapes around the hi-res screen through machine code.

Due to the byte mapped nature of the screen it would appear impossible to move any one screen location (byte) on to another location horizontally in any step size less than a byte. This byte jumping gives a jerky appearance to the movement.

Simon Lovett
Dore
Glas

IT IS simple to move graphics pixel by pixel using assembly language, if you use two shift commands. For example, in mode 4, to move a byte at loc. 3072 one pixel to the right you would use the following code:

```
LDX #3072
LDA X
CLRB
LSRA
RORB
STX X
STB 1,X
```

Using successive LSR and ROR's it is possible to smoothly move as many bytes as you like.

Relocatable routine

DRAGON's Basic has no instructions such as "RESTORE M" which is very useful when managing numerical data.

Do you know of a routine to replace RESTORE M?

Gilles Victor
Montrenney
France

THE DRAGON's restore command can only be used to reset the data pointer to the start of the program, not to any particular line. The short listing given will, when included in your programs, give this facility. To use it, simply type `XX=USR(n)` where "n" is the line number at which you want to



start reading data. The routine is relocatable in memory.

```
5 RESTORE TO A LINE
NUMBER
10 CLEAR000,30744
20 FOR I=0 TO 31: READ
AS: POKE 32744+I,
VAL("A"=A$): NEXT
30 DATA 80, 88, 27, 00,
28, 90, 19, 80, 04, 83, 25,
05, 38, 1F, 9F, 33, 99, C8,
0C, 7E, 83, 44
40 DEF USR(n)=30745
```

Confusing PUT options

AFTER playing around with the GETTING and PUTTING of graphics, I have come across a problem. I started experimenting with the other commands to PSET (that is, AND, NOT and so on). A problem arises when I use these commands. I started out by using OR, this should, according to the manual, have the effect of overlaying one drawing with another.

The result of using this is that the picture you are PUTTING goes "weird" and the picture you are trying to overlay gets erased. None of the other commands work either. Can you solve my problem?

Roberta Maryana
Wellingborough
Northants

THE PUT options OR, AND, NOT do work correctly, but they are a little confusing. Using "OR" will logically or the image in the array with that on the screen. This has the effect of blue + yellow = red, any other colour +

green = other colour. Using AND has the following effects: red + any colour = that colour, any colour + green = green. These two options work best if a red image is held in the array and is PUT on to a green background.

The NOT option takes no notice of what's actually in the array, it simply inverts a section of the screen within the given co-ordinates (that is, green becomes red, yellow becomes blue and vice versa).

Basic stack

WHAT DOES the FOR/NEXT and GOSUB/RETURN do to with the Basic stack? Is there a way to PUSH/PULL on it?

Olav Nielsen
Osborne
Denmark

EACH TIME a FOR/NEXT loop is used, or a gosub is encountered, addresses are pushed on to the Basic stack. When a NEXT or RETURN is used, an address is pulled from this stack. As the same stack is used for both loops and subroutines you cannot do the following:

```
10 FOR I = 1 TO 10
20 GOSUB 50
30 STOP
50 NEXT I
```

This stack is completely separate from the 8000 stacks and should not be confused with them, the Basic stack cannot be

directly used by the programmer.

Opcode error

HAVING recently started machine code, I am desperately trying to use the high resolution subroutines (for example, GET, PUT) in machine code. The method I use is to fool the computer in to running a Basic line during a machine code program, but with little success. The following routine should set a point at (100,100).

```
LDX $A0
PUSH X
LEAX @PSET,PCB
LDA X
ANDCC CBPE
JBR 42758 ;PSET routine location

PULB X
STX $A0
RTS

@PSET PCB 172, 40, 48, 48, 44, 48, 48, 41, 0
RTS

10 PMODE 4, 1: PCLS:
SCREEN 1,1: EXEC
WAIT$1
20 GOTO 20
```

The problem arises when entering the @PSET PCB line, as the cursor reaches the end of the line and on entering the remaining numbers on the next line, an invalid opcode error is reported during assembly. Can you be of any help?

M Jayadevan
Marshall
Cheshire

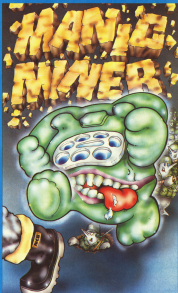
THE PROBLEM is as you suggested in the first @PSET, it is not necessary to have the commands taken value (V72) in this line, a correct version of this program would read:

```
LDX 100
PUSH X
LEAX @PSET,PCB
LDA X
STX 100
JBR 42758
PULB X
STX 100
RTS

@PSET 40,48,48,44,48, 48,41,58
```



Steve Willy, while prospecting these hidden city of mines opens an ancient, long forgotten mine shaft. On his first exploration, he finds evidence of a lost civilisation far superior to our own, which must communicate its dig deep into the Earth's core to supply the essential raw materials for their advanced industry. After centuries of peace and prosperity, the civilisation was torn apart by war, and legend into a long dark age, obscuring their history and any mine. "Probably" however, thought to tell the mine robots to stop working, and the mine control has become their final obstacle. As a result, a huge stockpile of valuable metals and minerals, and Steve Willy realises that he now has the opportunity to make his fortune by finding the underground mine. In order to move in the secret chambers, you must collect all the flashing keys in the mine while avoiding enemies like Poisonous Puffers and Spiders and Mine and world of all. Please Mining Machine. When you have all the keys, you can enter the portal which will take you to the final level. The game ends when you have found "gold" or fallen headily from mine.



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RETURN OF THE RING

THE BUNCH
OF
CACKLES
PART II

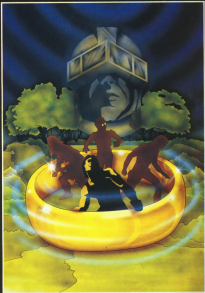
At least the region

The sword of Shadix is defeated, the Hall
sprawled hordes of the five
Sage lie at bay. Now
Ringbeasts, wielder of the
Four Bright Kings, must
face the greatest
challenge to return the
Ring Of Darkness to its
creators on the hidden
planet Ringworld. . . .
And somewhere at the
ends of time the forces of
evil are preparing their
return.

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Many birds arrived younger
months.

Please note: RETURN OF THE RING is a complete adventure. You need not buy THE RING OF DARKNESS to play it.



Abstract

[illegible][illegible]

How to Use the Table of Contents:

Figure 1

1000

For More on *Book Reviews* **C3**

Table 1

The following table shows the results of the regression analysis for the dependent variable "Perceived Organizational Support" (POS). The independent variables are "Organizational Commitment" (OC) and "Organizational Identification" (OI). The table includes the unstandardized coefficient (B), the standard error (SE), the t-value, and the p-value for each variable.

Variable	B	SE	t	p
Intercept	1.12	0.05	22.40	< .001
OC	0.15	0.02	7.50	< .001
OI	0.10	0.02	5.00	< .001
Adjusted R-squared	0.45			

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Competition Corner

Answers to Competition Corner
Dragon User, 12/13 Little Newport
Street, London WC2R 3LD



PRIZE

BEAU JOLLY is offering ten readers a chance to win one of its Dragon "valuables". The packs contain five games from Imagine Software's range of titles. They are: Pedro, BG 88, Cosmic Cruiser, Leggy and Arcade.

RULES

TO WIN a valupack you must show both the answer to the competition and how to solve it with the use of a Basic program developed on your Dragon. Please to not send in a cassette containing the answer. As a tie-breaker complete the following sentence in 15 words or less: "I want to own Beau Jolly's Dragon valuables because..."

Your entry must arrive at Dragon User by the last working day of December. The winners and the solution to the quiz will be published in our March issue. Entries will not be acknowledged and we cannot enter into correspondence on the result.

SEPTEMBER WINNER

THE WINNER of the September competition and recipient of £250 of software from Microdeal is David Richardson of Epsom in Surrey. David correctly stated that the correct solution was 84868. This is because 84868 multiplied by itself is 719528384. This is a ten digit number in which each of the digits 0,1,2,3,4,5,6,7,8,9 occurs once and only once.

RINGWORLD WINNERS

THE 50 winners in Waterplop's Ringworld competition each receive a copy of its latest adventure, the Return of the Ring. They are:

Michael Bancroft, Plymouth; A Kirk Cheahin; M Jones, Kent; Simon Green; Tyne & Wear; Fraser, Kempton; Wei Kai Tsang, Suffolk; G Pany, Swansea; P Richardson, Surrey; P Hamilton, Leicester; P Milnes, Newcastle; L Barnes, Doncaster; S Parker, Bucks; M Pardo, Leeds; A K Jones, Chrysl; G Southgreen, Kent; K M Holmes, Essex; P Regg, Aberdeen; C Edwards, Preston; A Stewart, Kent; J Pullman, Humberside; D Spiller, South Wilt; S Hunter, Southampton; G Thomas, Mid Glam; R Davies, Kent; R Getting, Kent; R Arnold, Beds; A Cook, Glasgow; M Daniel, Hants; S Matlock,

Magic cards

Beau Jolly provides the prizes to Gordon Lee's tour — card game

LAST CHRISTMAS on this page we took a look at the computer versions of a couple of traditional party games, so this year how about amusing the family with the computerised magic trick. Don't worry, we won't be saving it Dragon is safe!

Before starting, the program below should be loaded in to your computer. Then hand out an ordinary pack of cards to be shuffled and invite each of your spectators to select a card. Announce that the Dragon will attempt to identify the cards selected and invite each person in turn to sit at the computer. The computer will display the names of a number of cards and will ask if the spectator's card is listed.

Selections

By replying using keys "Y" or "N" a further few selections of cards are displayed. After the final reply has been made, the name of the card selected will be announced on the screen. Magic!

This month's competition is also related to playing cards. The other day the following curious conversation took place between the eccentric mathematician Professor Otto Hex and his equally eccentric son:



Professor Hex: "I have in my hand four cards taken from a standard deck of playing cards. They are a club, a diamond a heart and a spade. If I were to add the face value of the club to the face value of the diamond and then add the heart to the space and multiply these two totals together, the product is equal to thirteen. Byt's age next birthday!"

Hex Junior: "There are many combinations of cards that will produce that total." Professor Hex: "Quite correct. In fact the number of different combinations of four cards taken from a standard pack that will equal that total is in fact, a prime number."

Hex Junior: "I still need more information." Professor Hex: "Well, two cards have the same value, but neither is the club — which is a hint."

Hex Junior: "Now I know all four cards." (Note that Jack = 11, Queen = 12 and King = 13 — and it should be assumed that sufficient time elapsed between each statement to allow Hex Junior to make the necessary calculations.)

What were the four cards (and how old is Bertram Byt)? ■

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100 CLEAR :SACON 88:89:90:91:92:93:94:95:96:97:98:99:100
101 DATA 408,740,7488,7408,7476,8114,8128,8136,8144,8152,8160,8168,8176,8184,8192,8200,8208,8216,8224,8232,8240,8248,8256,8264,8272,8280,8288,8296,8304,8312,8320,8328,8336,8344,8352,8360,8368,8376,8384,8392,8400,8408,8416,8424,8432,8440,8448,8456,8464,8472,8480,8488,8496,8504,8512,8520,8528,8536,8544,8552,8560,8568,8576,8584,8592,8600,8608,8616,8624,8632,8640,8648,8656,8664,8672,8680,8688,8696,8704,8712,8720,8728,8736,8744,8752,8760,8768,8776,8784,8792,8800,8808,8816,8824,8832,8840,8848,8856,8864,8872,8880,8888,8896,8904,8912,8920,8928,8936,8944,8952,8960,8968,8976,8984,8992,9000,9008,9016,9024,9032,9040,9048,9056,9064,9072,9080,9088,9096,9104,9112,9120,9128,9136,9144,9152,9160,9168,9176,9184,9192,9200,9208,9216,9224,9232,9240,9248,9256,9264,9272,9280,9288,9296,9304,9312,9320,9328,9336,9344,9352,9360,9368,9376,9384,9392,9400,9408,9416,9424,9432,9440,9448,9456,9464,9472,9480,9488,9496,9504,9512,9520,9528,9536,9544,9552,9560,9568,9576,9584,9592,9600,9608,9616,9624,9632,9640,9648,9656,9664,9672,9680,9688,9696,9704,9712,9720,9728,9736,9744,9752,9760,9768,9776,9784,9792,9800,9808,9816,9824,9832,9840,9848,9856,9864,9872,9880,9888,9896,9904,9912,9920,9928,9936,9944,9952,9960,9968,9976,9984,9992,10000
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473 IF 84868>84868 THEN PRINT "TOO HIGH"
474 IF 84868=84868 THEN PRINT "CORRECT"
475 IF 84868<84868 THEN PRINT "TOO LOW"
476 IF 84868>84868 THEN PRINT "
```

St. George now has two choices!

Red or green will slay the Dragon

- ▲ Nylon encased-Steel shafted joystick with ball and socket joint.
- ▲ Fast sprung return to centre.
- ▲ Graphite wiper linear potentiometers.
- ▲ 12 Months Guarantee.
- ▲ 7 day Money back Guarantee.

Complete control at your fingertips

The smooth control of the Voltmace delta spring return joystick is now available to Dragon owners. Each joystick has been individually tested before it leaves our factory, following extensive robot testing to prove the design (we tested it more than a million times). This means that not only will your joystick be strong, tough and reliable, but it ensures long life, accurate control and with the choice of red or green fire buttons, gives instant recognition between the left and right joysticks.

If you are not completely satisfied with the delta 3d, return it so as we have seven days for a full refund.



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DELTA 3d JOYSTICK (RM)
TWO DELTA 3d JOYSTICKS OR 1d
PLEASE STATE COLOURS REQUIRED

Prices include VRT and P&P

Voltmace delta 3d

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DRAGON 32
TANDY COLOUR 32 K

TIME BANDIT

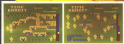
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Worlds of Time, each containing a multitude of colourful and unique
adventuring areas. Visit the medieval Dungeons of Fantasy World,
recapture the days of yesteryear in Western World, and reach for the
Stars in Future World. Do battle with the Evil Guardians,
Looking Lunkers, Angry Almo, and the Killer Smurph!!
Find the keys and escape with the treasures of time.

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